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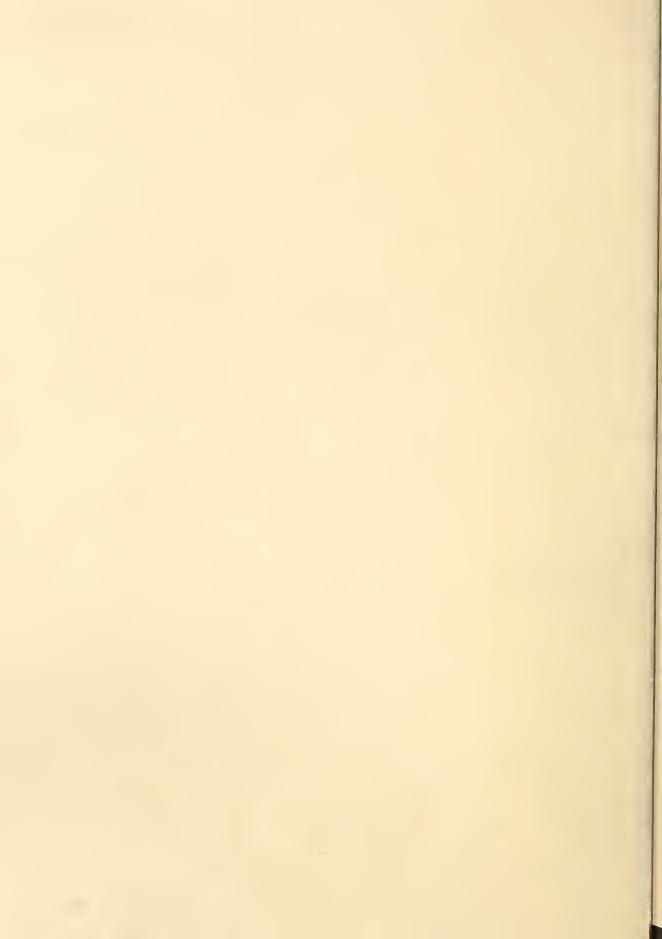
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1970 REPORT OF

EGG PRODUCTION TESTS

UNITED STATES AND CANADA

● RANDOM SAMPLE EGG PRODUCTION TESTS

TWO-YEAR COMBINED SUMMARY, 1968-69 AND 1969-70
PROCEDURES FOR COMPUTING COMBINED SUMMARY
RANGE GROUP RANKINGS, 1969-70
SUPERVISORS, ENTRANTS, AND MANAGEMENT, 1969-70

AGRICULTURAL RESEARCH SERVICE ● U.S. DEPARTMENT OF AGRICULTURE

Egg production tests are designed to provide poultrymen, hatcherymen, and breeders with a reliable guide to the performance of poultry stocks offered for sale. This publication contains information on many egg production traits that are of economic importance to the trade. The data were compiled from the records of official Random Sample Egg Production Tests conducted in the United States and Canada. The data resulting from these tests have been analyzed statistically by Biometrical Services Staff of USDA's Agricultural Research Service, Beltsville, Md.

The publication of this report is based on recommendations of the National Committee on Random Sample Poultry Testing and those of the Council of American Official Poultry Tests. Information in this report was compiled by the Poultry Research Branch, Animal Husbandry Research Division, Agricultural Research Service from data furnished by Test Supervisors.

The publication of this report does not imply approval or endorsement by the U.S. Department of Agriculture of any of the stocks mentioned.

CONTENTS

This report is divided into four sections:

1. A 2-year combined summary of the data obtained in the 1968-69 and 1969-70 Random Sample Egg Production Tests. These data were treated by acceptable statistical procedures that allow the reader to compare directly the stock entered in the various egg production tests in the United States and Canada.

2. An explanation of statistical procedures that were used in computing the regressed means and confidence limits of egg production traits evaluated in the 2-year combined summary.

3. A range group ranking for stock that was entered in 1969-70 Random Sample Egg Production Tests. The ranking shows the performance of each stock by traits compared with that of other stock in the same test.

4. List of stocks entered in 1969-70 tests and some of the management conditions at the test during the 1969-70 test year.

TWO-YEAR COMBINED SUMMARY FOR TEST YEARS 1968-69 and 1969-70

Entries in the various tests start with a random sample of hatching eggs or chicks of the stock to be tested. Samples are drawn according to prescribed methods to ensure that each entry is typical of the stock it represents. All entries within a test are treated alike with respect to housing, feeding, management, and disease control in order to avoid differences in performance that would be due to environment.

All tests are conducted according to these basic principles. However, even the most carefully designed and conducted tests are influenced by errors of two kinds. The first kind of error is the chance deviation or unavoidable "sampling error" made when a small sample of eggs or chicks represents an entry. The other kind of error is due to uncontrolled or unknown environmental differences between entries that occur in spite of all efforts to treat all entries within a given test as nearly alike as possible. The differences between the results for two entries in a single test for a single year may be due to these chance variations rather than to a real difference in the performance capabilities of the two stocks. The effect of such errors in comparing stocks can be materially reduced by basing comparisons on the combined results of several tests over 2 or more years. If all entries compared were entered in the same tests in both years, the simple averages could be compared directly without adjustment.

However, differences among tests and between years and those caused by climatic conditions and other environmental factors affect the results. As a consequence, a direct comparison of the test results of two stocks in different tests or in different years may be misleading. Therefore, to present test results in a manner that will allow sound evaluation of all stocks tested, the results were combined, by stocks and by years, and were adjusted by accepted statistical procedures for test and year differences and for variation in amount of information per stock. The results of these computations are published as the "regressed mean" for each trait for each stock that was tested (table 1).

The performance data (regressed means) reported in this summary are derived from the results reported by the individual tests for each of the past 2 years. It is unlikely, however, that the means for any stock, even though entered in only 1 test each year, will coincide precisely with the 2-year average performance data as published by the test. The variations are due to adjustments for test differences, year difference, the number of tests and of years entered, and the number of replicates per test. These statistical adjustments allow predictions of what the average performance would have been for each stock had all stocks been entered in all tests each year.

The statistical treatment applied to the test data is designed to reduce the influence of nongenetic variations. This cannot be accomplished perfectly, and consequently, estimates or predictions of performance cannot be made with absolute precision. However, reliable predictions, within prescribed limitations, can be made as to whether a difference in the reported performance of two stocks represents a real difference in their performance. These predictions involve the use of the confidence limit values that have been computed for each trait or performance factor reported.

A brief explanation of the statistical procedures used in computing the regressed means, confidence limits, and performance index is provided in the section entitled "Procedures Used for Computing Combined Summary Values."

The following example illustrates the compilation of the 2-year combined summary. This and the related expla-nation will help the reader to use and interpret the data in table 1.

(Illustration of regressed means and 80-percent confidence limits
as they might appear for a few traits)

STOCK CODE	BODY WEIGHT (pounds)		FEED PER POUND OF EGGS PRODUCED (pounds)		EGG WEIGHT (oz./doz.)		LARGE AND EXTRA LARGE EGGS (percent)		ALBUMEN QUALITY (Haugh units)		BLOOD SPOTS 1/8 INCH OR MORE (percent)		BLOOD SPOTS LESS THAN 1/8 INCH (percent)	
	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS
		5.4		2.95		25.7		75.2		77.1		0.9		2.2
995	5.6	5.8	3.02	3.09	26.0	26.3	77.5	79.8	77.9	78.7	1.1	1.4	2.7	3.2
		4.0		2.77		25.0		69.0		80.1		0.6		0.8
996	4.2	4.4	2.83	2.89	25.2	25.4	71.0	72.8	80.9	81.7	0.7	1.0	1.1	1.4
		4.5		2.86		24.6		65.5		73.3		1.0		1.5
997	4.7	4.9	2.94	3.02	24.9	25.2	68.0	70.3	74.1	74.9	1.2	1.4	1.9	2.4
		3.7		2.73		24.9		69.2		75.5		0.9		1.2
998	4.0	4.3	2.84	2.95	25.3	25.7	72.4	75.6	76.6	77.7	1.0	1.2	1.5	1.9
		3.9		2.47		25.0		67.6		82.3		0.6		0.7
999	4.2	4.5	2.56	2.65	25.4	25.8	70.3	73.0	83.0	83.7	0.8	1.0	1.1	1.4

If the confidence limits for two regressed means overlap, the two means are not significantly different at the 5% level.

The range of the confidence limits represents the amount of difference in the performance of two stocks that may be due to chance. If the confidence limits for two regressed means overlap, the two means are not significantly different at the 5-percent level of probability. If the confidence limits for two regressed means do not overlap, the odds are at least 19 in 20 that a real difference exists in the performance of the two stocks.

The use of the above data as a means of evaluating different stocks and traits can be illustrated as follows:

For the trait "Body Weight," the confidence limits of Stock 995 (5.4 to 5.8 lbs.) do not overlap the confidence limits of any of the other stocks. Therefore, Stock 995 has a significantly higher body weight than the others. However, the confidence limits of Stock 996 (4.0 to 4.4 lbs.) overlap the con-fidence limits of Stocks 998 (3.7 to 4.3 lbs.) and Stock 999 (3.9 to 4.5 lbs.). The body weights of these three stocks are, therefore, not significantly different.

Using the trait "Feed per Pound of Eggs Produced" as another example, the confidence limits of Stock 995 (2.95 to 3.09 lbs.), Stock 997 (2.86 to 3.02 lbs.), and Stock 998 (2.73 to 2.95 lbs.) all overlap each other. Thus there is no significant difference in the feed conversion of these three stocks. When comparing the feed conversion of Stock 999 (2.56 lbs.) with that of the other stocks, we see that the range of its confidence limits is from 2.47 to 2.65 lbs. Since this range does not overlap the confi-dence limits of the other four stocks, Stock 999 has a significantly lower feed conversion than the other stocks listed.

Another example can be shown by using the trait "Albumen Quality." The confidence limits of Stock 995 (77.1 to 78.7) overlap the confidence limits of Stock 998 (75.5 to 77.7). Therefore, there is no signif-icant difference in the albumen quality of these two stocks, even though the regressed mean of Stock 995 is 77.9 Haugh Units and Stock 998 is 76.6 Haugh Units. When Stock 995 is compared with Stocks 996 and 999, we see that the confidence limits of these two stocks do not overlap those of Stock 995. Thus, these two stocks have a significantly higher albumen quality (80.9 and 83.0 Haugh Units, respectively) than the 77.9 Haugh Units of Stock 995. In comparing Stock 995 with Stock 997, the confidence limits do not overlap. In this case, the albumen quality of Stock 997, expressed as a regressed mean of 74.1 Haugh Units is significantly lower than the regressed mean of Stock 995.

The range of the confidence limits will not necessarily be the same for two different stocks that have the same regressed mean. The number of locations in which a stock is entered, the number of replicate pens per location, the number of years entered, and the accuracy involved in adjusting for location and year effects all have a bearing on the range of the confidence limits for each individual regressed mean.

The "Income Over Feed and Chick Cost" figures reported in table 1 represent the sales value of the eggs produced and of the hens at the end of the test minus the cost of the chicks and the feed used during the growing and laying periods. These figures may be useful in comparing the overall performance of stocks, but they should not be considered as predictions of "profit" to be obtained under commercial operations. The "income" figures should be reduced by other costs, such as labor, building and equipment depreciation, vaccination, litter, interest, taxes, and insurance, to approximate profits that might be expected under commercial conditions. Surveys conducted among commercial producers indicate that such other costs may range from $1 to $2 per pullet housed.

Although the average chick price is reported for each stock, this value cannot be appropriately used to convert the "Income Over Feed and Chick Cost" figure to an income over feed cost figure. The average chick price shown is a simple unadjusted average of the prices reported by the entrant for his entries in the various tests and is not directly comparable to chick cost included in "Income Over Feed and Chick Cost."

Stocks Should be Compared for all Traits

All traits should be considered when using this report to evaluate the overall performance of the various stocks. The values reported for "Income Over Feed and Chick Cost" represent a composite of several traits, combined as determined by the economic conditions of the areas in which the tests are located. The conditions under which the stock is expected to perform in commercial production may differ from those prevailing at the tests, and such differences should be taken into consideration. For example, a poultryman whose local market pays unusually good premiums for large and extra large eggs should place more emphasis on egg size in his evaluation of stock than poultrymen located in areas where such premiums are not available. The local market preference for brown or white shells should also be taken into account. Traits related to interior egg quality that affect the grade are of greatest importance in areas where prices are based on quality standards.

Each person should study his local needs and conditions and then place appropriate emphasis on the performance traits that are of greatest importance to his situation. A productive and profitable stock for one poultryman under one set of conditions may not fit the needs of another poultryman under a different set of conditions.

Definitions of Terms Used and Abbreviations

Stock: A term used to identify a specific breeding combination of chickens. These breeding combinations may include pure strains, strain crosses, breed crosses, incrossbreds, or combinations thereof. Kinds of stock and breeding methods are---

BA	Black Australorp	RIW	Rhode Island White	BX	Crossbred
BPR	Barred Plymouth Rock	Syn.	Synthetic	IN	Incross
CG	California Gray	WL	White Leghorn	INX	Incrossbred
NH	New Hampshire	WPR	White Plymouth Rock	PS	Pure Strain
RIR	Rhode Island Red			SX	Strain Cross

Tests: California (Calif.)   New Hampshire (N. H.)
Central Canada (C. C.)   New Jersey (N. J.)
Florida (Fla.)   North Carolina (N. C.)
Minnesota (Minn.)   Pennsylvania (Pa.)
Missouri Cage (Mo.-C.)   Tennessee (Tenn.)
Missouri Floor (Mo.-F.)   Texas (Texas)

Test Year: A period beginning during the first year stated in a double-year designation and ending approximately 500 days later. See management summary shown in table 7.

Definition of Traits

Growing mortality
: Percentage of birds that died on or before the time they were 150 days old or subsequent age at housing.

Laying mortality
: Percentage of birds that died after they were 150 days old or subsequent age at housing.

Age at 50 percent production
: Days of age computed from the first day of the first 2 consecutive days of 50 percent production for living birds in the entry at that time.

Hen-housed egg production
: Number of eggs laid per pullet housed computed from time of housing to the end of the test.

Hen-day egg production (to end of test)
: Percent hen-day production from the time birds reached 50 percent production to end of test.

Hen-day egg production (last 30 to 60 days)
: Percent hen-day production during the last 30 to 60 days of the test. Length of time involved varies according to the record keeping system of each individual test.

Feed per pound of eggs
: Pounds of feed per pound of eggs produced, computed from bulk weighing of the eggs at least 1 day every 2 weeks or 2 days a month at equal intervals during the laying period of the test.

Egg weight
: The weight of a dozen eggs computed from bulk weighing of the eggs at least 1 day every 2 weeks or 2 days a month during the laying period of the test.

Large and extra large eggs
: Percentage of large and extra large eggs as determined by egg-size distribution computed from all eggs laid 1 day each week.

Albumen quality
: Haugh units, computed from egg weight and albumen height of broken-out egg measured on 1 day's eggs per quarter, at equal intervals. The greater the Haugh units the higher the albumen quality.

Large blood spots
: Percentage of eggs with one or more large blood spots (1/8 inch or more in diameter), computed from at least 3 days' eggs per quarter, broken-out basis.

Small blood spots
: Percentage of eggs with one or more small blood spots (less than 1/8 inch in diameter), computed from at least 3 days' eggs per quarter, broken-out basis.

Large meat spots
: Percentage of eggs with one or more colored large meat spots (1/8 inch or more in diameter), computed from at least 3 days' eggs per quarter, broken-out basis.

Small meat spots
: Percentage of eggs with one or more colored small meat spots (less than 1/8 inch in diameter), computed from at least 3 days' egg per quarter, broken-out basis.

Specific gravity score
: Eggs are given the specific gravity score that corresponds with the specific gravity of the solution in which they will float. Eggs that do not float in 1.100 solution are given a nine score. The specific gravity of an egg is closely correlated with shell thickness; therefore, the higher the specific gravity score, the thicker the shell. Tabulation of specific gravity solutions and the corresponding specific gravity scores follow:

Solution	Score	Solution	Score
1.068	0	1.088	5
1.072	1	1.092	6
1.076	2	1.096	7
1.080	3	1.100	8
1.084	4		

Body weight
: Average weight of birds alive at end of test.

Income over feed and chick cost
: Income over feed and chick cost per pullet housed, with chick cost in 1,000 lots at hatch date adjusted for mortality (accidental deaths, sexing errors, and missing chicks not included).

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Central Canada Random Sample Egg Production Test
    M. S. Mitchell, Poultry Production Section, Canada Department of Agriculture, Ottawa, Ontario, Canada

Florida National Egg Laying Test
    R. B. Christmas, Chipley, Fla. 32428

Minnesota Random Sample Egg Production Test
    Robert E. Moehrle, Department of Agriculture, Divison of Poultry Industries, 430 State Office Building,
    St. Paul, Minn. 55101

Missouri Random Sample Egg Production Test (Cage)
    Charles W. McElyea, P. O. Box 530, Mountain Grove, Mo. 65711

Missouri Random Sample Egg Production Test (Floor)
    Charles W. McElyea, P. O. Box 530, Mountain Grove, Mo. 65711

New Hampshire Multiple Unit Egg Production Test
    W. C. Skoglund, Department of Poultry Science, University of New Hampshire, Durham, N. H. 03824

New Jersey Random Sample Egg Laying Test
    John J. Dowling, Jr., Rutgers University, New Brunswick, N. J. 08903

North Carolina Random Sample Egg Laying Test, Salisbury
    G. A. Martin, Poultry Extension Department, North Carolina State University, Raleigh, N. C. 27607

Pennsylvania Random Sample Laying Test
    Paul J. Turek, Pennsylvania Furance, Pa. 16865

Tennessee Random Sample Laying Test
    O. E. Goff, Poultry Department, University of Tennessee, Knoxville, Tenn. 37916

Texas Genetic Environment Performance Testing Program
    Bill H. Doran, Texas A & M University, College Station, Tex. 77843

Copies of the final report for any of the Random Sample Egg Production Tests listed above can be
obtained by writing to the test supervisor.

Table 1.--Two-year combined summary: Regressed means and 80% confidence limits for traits by stocks entered

STOCK CODE	BREEDER'S NAME AND ADDRESS	BREEDING	STRAIN OR TRADENAME	NO. PENS / NO. LOCATIONS	AVG. CHICK PRICE (Cents)	MORTALITY GROWING (percent) RE-GRESSED MEAN	80%* CONF. LIMITS	MORTALITY LAYING (percent) RE-GRESSED MEAN	80%* CONF. LIMITS	AGE AT 50% PRODUCTION (days) RE-GRESSED MEAN	80%* CONF. LIMITS	HEN HOUSED (number) RE-GRESSED MEAN	80%* CONF. LIMITS	EGG PRODUCTION HEN-DAY (TO END OF TEST) RE-GRESSED MEAN	80%* CONF. LIMITS	HEN-DAY (LAST 30-60 DAYS) RE-GRESSED MEAN	80%* CONF. LIMITS
570	Animal Research Institute Ottawa, Ontario, Canada	WL PS	Kentville, R. B. C. -	14 / 4	40.0	6.0	5.0 7.2	16.3	15.0 17.6	175	171 179	192	185 199	61.4	59.7 63.1	52.9	50.5 55.3
10	Anthony, George M. & Sons Strausstown, Pa. 19559	WL SX	Anthony - - - - - - - - - -	56 / 14	37.5	5.6	4.7 6.7	15.3	13.9 16.7	176	173 179	209	203 215	66.3	64.9 67.7	58.2	56.2 60.2
307	Babcock Poultry Farm, Inc. Ithaca, N. Y. 14851	WL SX	Babcock B-300 - - - -	110 / 26	33.9	7.9	6.8 9.0	16.2	14.8 17.6	164	161 167	222	216 228	71.0	69.7 72.3	62.3	60.5 64.1
405	Babcock Poultry Farm, Inc. Ithaca, N. Y. 14851	WL SX	Babcock B-305 - - - -	62 / 22	34.0	6.6	5.6 7.8	16.3	14.9 17.7	165	162 168	219	212 226	70.7	69.3 72.1	62.1	60.1 64.1
377	Babcock Poultry Farm, Inc. Ithaca, N. Y. 14851	RIRxBPR BX	Babcock B-390 - - - -	13 / 6	36.0	5.1	4.1 6.1	14.0	12.8 15.2	171	167 175	207	200 214	63.8	62.1 65.5	53.8	51.3 56.3
361	Burling Hatchery Oxford, Pa. 19363	RIRxWPR BX	Golden Tri-Cross - -	6 / 2	34.0	4.9	4.0 5.8	14.8	13.3 15.9	170	166 174	203	195 211	62.5	60.5 64.5	54.4	51.9 56.9
372	Carey Farms Marion, Ohio 43302	WL IN	Carey's New Nick -	14 / 3	32.0	5.5	4.5 6.6	15.0	13.9 16.3	176	172 180	214	206 222	68.9	67.1 70.7	56.5	54.0 59.0
397	Carey Farms Marion, Ohio 43302	CGxWL BX	Carey New Spots - - -	12 / 4	32.0	10.0	8.7 11.5	16.5	15.3 17.8	174	171 177	203	196 210	66.2	64.5 67.9	57.6	55.1 60.1
31	Cashman Leghorn Farms Webster, Ky. 40176	WL IN	Cashman Hi-Cash - -	67 / 16	30.6	6.4	5.4 7.5	15.4	14.1 16.8	176	173 179	207	200 214	67.2	65.8 68.6	59.6	57.7 61.5
414	Colonial Poultry Farm, Inc. Pleasant Hill, Mo. 64080	WL IN	True-Line 142 S - - -	6 / 1	30.0	5.7	5.0 6.4	15.8	14.9 16.8	167	162 172	208	200 216	64.9	62.8 67.0	55.7	53.1 58.3
289	Colonial Poultry Farm, Inc. Pleasant Hill, Mo. 64080	WL IN	True-Line 365 B - - -	30 / 10	26.8	5.6	4.6 6.7	15.6	14.3 16.9	167	163 171	212	205 219	66.8	65.3 68.3	57.3	55.1 59.5
399	Davis, Joe K. Hatchery Earl, N. C. 28038	RIR SX	Davis Red - - - - - - - -	53 / 19	34.0	4.9	4.0 5.9	11.7	10.5 13.0	178	174 182	204	198 210	61.9	60.5 63.3	51.5	49.6 53.4

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STOCK CODE	FEED PER POUND OF EGGS PRODUCED (pounds)		EGG WEIGHT (oz./doz.)		LARGE AND EXTRA LARGE EGGS (percent)		ALBUMEN QUALITY (Haugh units)		BLOOD SPOTS 1/8 INCH OR MORE (percent)		BLOOD SPOTS LESS THAN 1/8 INCH (percent)		MEAT SPOTS 1/8 INCH OR MORE (percent)		MEAT SPOTS LESS THAN 1/8 INCH (percent)		SPECIFIC GRAVITY SCORE		BODY WEIGHT (pounds)		INCOME OVER FEED AND CHICK COST (dollars)	
	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS	RE-GRESSED MEAN	80% CONF. LIMITS
570	3.00	2.91 3.09	24.9	24.6 25.2	69.1	66.4 71.8	77.8	76.7 78.9	1.4	1.2 1.6	1.5	1.1 1.8	0.4	0.2 0.7	0.3	0.1 0.6	4.28	4.15 4.41	4.4	4.1 4.7	2.70	2.48 2.92
10	2.77	2.70 2.84	25.6	25.3 25.9	78.8	76.6 81.0	82.1	81.2 83.0	1.0	0.8 1.2	1.2	0.9 1.4	0.2	0.1 0.3	0.1	0.1 0.2	3.75	3.66 3.84	4.4	4.2 4.6	3.29	3.10 3.48
307	2.61	2.54 2.68	25.3	25.1 25.5	77.7	75.6 79.8	77.0	76.2 77.8	1.4	1.2 1.7	1.4	1.1 1.6	0.3	0.2 0.4	0.3	0.2 0.4	4.09	4.01 4.17	4.2	4.1 4.3	3.62	3.44 3.80
405	2.59	2.52 2.66	25.6	25.3 25.9	78.5	76.1 80.9	76.4	75.5 77.3	1.1	0.9 1.3	1.2	0.9 1.5	0.3	0.1 0.5	0.3	0.2 0.4	4.06	3.97 4.15	4.2	4.0 4.4	3.59	3.39 3.79
377	3.01	2.93 3.09	26.4	26.1 26.7	85.9	83.3 88.5	78.4	77.3 79.5	1.3	1.1 1.5	2.6	2.1 3.0	3.6	2.8 4.6	10.9	9.5 12.4	3.60	3.47 3.73	5.6	5.4 5.8	3.00	2.79 3.21
361	3.03	2.93 3.13	25.8	25.4 26.2	79.9	76.8 83.0	79.6	78.3 80.9	1.2	1.0 1.4	2.4	2.1 2.8	3.2	2.2 4.4	11.9	9.9 14.0	3.59	3.43 3.75	5.5	5.3 5.7	2.82	2.59 3.05
372	2.85	2.76 2.94	25.2	24.8 25.6	72.6	69.8 75.4	78.3	77.2 79.4	1.1	0.9 1.3	1.4	1.1 1.7	0.4	0.1 0.7	0.3	0.1 0.7	4.22	4.08 4.36	4.6	4.4 4.8	3.36	3.14 3.58
397	2.83	2.74 2.92	24.9	24.6 25.2	72.6	70.0 75.2	77.1	76.0 78.2	0.9	0.7 1.1	1.1	0.9 1.4	0.2	0.1 0.5	0.2	0.1 0.4	4.11	3.98 4.24	4.8	4.5 5.1	3.01	2.79 3.23
31	2.87	2.80 2.94	25.4	25.1 25.7	77.5	75.3 79.7	78.5	77.6 79.4	1.3	1.1 1.6	1.6	1.3 2.0	0.2	0.1 0.3	0.3	0.2 0.5	4.26	4.18 4.34	4.7	4.5 4.9	3.16	2.97 3.35
414	2.77	2.65 2.89	25.4	25.0 25.8	76.4	72.8 80.0	76.6	75.2 78.0	1.2	1.0 1.4	1.4	1.2 1.7	0.3	0.1 0.7	0.2	0.1 0.6	4.34	4.16 4.52	4.5	4.2 4.8	3.21	2.97 3.45
289	2.71	2.63 2.79	25.0	24.7 25.3	73.2	70.8 75.6	77.8	76.9 78.7	1.4	1.2 1.7	1.4	1.1 1.7	0.1	0.1 0.3	0.3	0.1 0.5	4.24	4.13 4.35	4.2	4.0 4.4	3.39	3.18 3.60
399	3.10	3.03 3.17	25.7	25.5 25.9	80.1	77.9 82.3	78.6	77.7 79.5	1.1	0.9 1.3	2.2	1.8 2.6	7.7	6.8 8.6	13.9	12.9 15.0	3.28	3.19 3.37	5.6	5.4 5.8	2.97	2.78 3.16

*If the confidence limits for two regressed means overlap, the two means are not significantly different at the 5% level.

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Table 1.--Two-year combined summary: Regressed means and 80% confidence limits for traits by stocks entered *(Continued)*

STOCK CODE	BREEDER'S NAME AND ADDRESS	STRAIN OR TRADENAME	BREEDING	NO. PENS	NO. LOCATIONS	AVG. CHICK PRICE (Cents)	MORTALITY GROWING (percent) RE-GRESSED MEAN	80%* CONF. LIMITS	MORTALITY LAYING (percent) RE-GRESSED MEAN	80%* CONF. LIMITS	AGE AT 50% PRODUCTION (days) RE-GRESSED MEAN	80%* CONF. LIMITS	HEN HOUSED (number) RE-GRESSED MEAN	80%* CONF. LIMITS	EGG PRODUCTION HEN-DAY (TO END OF TEST) (percent) RE-GRESSED MEAN	80%* CONF. LIMITS	EGG PRODUCTION HEN-DAY (LAST 30-60 DAYS) (percent) RE-GRESSED MEAN	80%* CONF. LIMITS
350	Erath Egg Farm Stephenville, Tex. 76401	Erath Mestiza------	--- Inx	17	4	0.0	7.1	5.9 8.3	17.4	16.1 18.8	169	166 172	202	194 210	67.0	65.4 68.6	55.5	53.1 57.9
604	Fisher Poultry Farm, Ltd. Ayton, Ontario, Canada	Fisher 105-------	WL SX	18	6	34.0	7.4	6.2 8.6	17.6	16.3 19.0	171	168 174	201	194 208	66.0	64.4 67.6	59.1	56.8 61.4
66	Garber Poultry Br. Farm Modesto, Calif. 95351	Garber G 200------	WL SX	56	12	30.6	6.7	5.7 7.9	15.3	14.0 16.7	172	169 175	207	200 214	66.0	64.7 67.3	55.5	53.5 57.5
65	Garber Poultry Br. Farm Modesto, Calif. 95351	Garber G x 291-----	CGxWL BX	50	11	31.3	5.2	4.3 6.2	14.9	13.6 16.3	165	161 169	209	203 215	65.4	63.9 66.9	54.1	52.0 56.2
413	Garrison, Earl W. Bridgeton, N. J. 08302	Garrison 301------	WL SX	1	1	35.0	5.6	5.0 6.3	15.2	14.6 15.9	171	167 175	206	199 213	66.0	63.8 68.2	57.1	54.9 59.3
225	Harco Farms South Easton, Mass. 02375	Harco Sex Link----	RIRxBPR BX	25	10	36.5	4.4	3.5 5.4	14.6	13.3 15.9	173	170 176	208	201 215	65.3	63.8 66.8	55.5	53.1 57.9
86	Hardy, C. Nelson & Sons Essex, Mass. 01929	Deluxe Sex Link ---	RIRxBPR BX	7	4	32.0	4.3	3.4 5.2	16.6	15.4 17.8	176	172 180	185	177 193	58.2	56.3 60.1	48.7	46.2 51.2
378	Hubbard Farms, Inc. Walpole, N. H. 03608	Colden Comet -----	Syn. x NH BX	43	13	34.8	3.3	2.6 4.1	16.0	14.6 17.4	168	165 171	200	194 206	62.6	61.2 64.0	49.5	47.5 51.5
96	Hy-Line Poultry Farm Des Moines, Iowa 50309	Hy-Line 934-------	--- INX	46	15	41.6	5.0	4.1 6.0	13.4	12.2 14.7	174	171 177	213	207 219	66.1	64.7 67.5	58.8	56.6 61.0
385	Hy-Line Poultry Farm Des Moines, Iowa 50309	Hy-Line 934 E-----	--- INX	62	13	43.4	6.0	5.0 7.1	15.5	14.1 16.9	173	170 176	208	202 214	66.4	65.0 67.8	57.4	55.5 59.3
411	Hy-Line Poultry Farms Des Moines, Iowa 50309	Hy-Line 934 L-----	--- INX	10	4	49.0	4.9	4.0 5.9	15.0	13.9 16.2	175	171 179	214	206 222	68.0	66.1 69.9	59.7	57.2 62.2
356	Ideal Plty. Br. Farm, Inc. Cameron, Texas 76520	Ideal 236---------	Syn. x WL BX	76	17	34.3	4.7	3.9 5.6	15.8	14.4 17.2	172	169 175	212	205 219	67.2	65.8 68.6	61.4	59.5 63.3

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STOCK CODE	FEED PER POUND OF EGGS PRODUCED (pounds)		EGG WEIGHT (oz./doz.)		LARGE AND EXTRA LARGE EGGS (percent)		ALBUMEN QUALITY (Haugh units)		BLOOD SPOTS 1/8 INCH OR MORE (percent)		BLOOD SPOTS LESS THAN 1/8 INCH (percent)		MEAT SPOTS 1/8 INCH OR MORE (percent)		MEAT SPOTS LESS THAN 1/8 INCH (percent)		SPECIFIC GRAVITY SCORE		BODY WEIGHT (pounds)		INCOME OVER FEED AND CHICK COST (dollars)	
	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS
350	2.79	2.70 2.88	24.4	24.1 24.7	74.3	70.7 77.9	77.7	76.7 78.7	1.0	0.8 1.3	1.5	1.2 1.9	0.1	0.1 0.4	0.1	0.1 0.2	3.91	3.79 4.03	4.6	4.4 4.8	3.52	3.28 3.76
604	2.70	2.61 2.79	25.0	24.6 25.4	71.8	69.3 74.3	82.6	81.6 83.6	1.0	0.8 1.2	1.1	0.8 1.4	0.4	0.2 0.7	0.3	0.2 0.6	4.69	4.57 4.81	4.0	3.8 4.2	3.19	2.98 3.40
66	2.80	2.73 2.87	25.2	24.9 25.5	76.1	73.8 78.4	81.7	80.8 82.6	0.7	0.6 0.9	0.9	0.6 1.1	0.1	0.1 0.3	0.2	0.1 0.3	4.54	4.45 4.63	4.5	4.3 4.7	3.38	3.17 3.59
65	2.85	2.77 2.93	25.1	24.8 25.4	73.7	71.4 76.0	77.3	76.4 78.2	0.7	0.5 0.8	0.9	0.6 1.1	0.2	0.1 0.4	0.3	0.2 0.5	3.91	3.82 4.00	4.9	4.7 5.1	3.19	3.00 3.38
413	2.84	2.71 2.97	25.4	24.9 25.9	76.8	72.9 80.7	80.3	78.5 82.1	1.2	1.0 1.3	1.4	1.2 1.6	0.3	0.1 0.8	0.3	0.1 1.1	4.13	3.91 4.35	4.8	4.5 5.1	3.11	2.89 3.33
225	2.96	2.88 3.04	27.1	26.8 27.4	88.8	86.5 91.1	79.5	78.5 80.5	1.3	1.0 1.5	1.8	1.5 2.2	6.0	5.1 7.0	14.4	13.1 15.7	3.39	3.28 3.50	5.9	5.7 6.1	3.07	2.87 3.27
86	3.26	3.16 3.36	26.4	26.0 26.8	84.6	81.8 87.4	76.9	75.6 78.2	1.2	1.0 1.4	1.4	1.2 1.8	3.2	2.2 4.3	14.8	12.7 16.9	3.93	3.77 4.09	5.9	5.6 6.2	2.39	2.16 2.62
378	2.85	2.78 2.92	26.8	26.5 27.1	85.8	83.6 88.0	79.9	79.0 80.8	1.2	1.0 1.4	2.4	2.0 2.8	6.0	5.2 6.9	16.8	15.7 18.0	3.31	3.22 3.40	5.1	4.9 5.3	3.06	2.97 3.25
96	2.63	2.56 2.70	26.2	25.9 26.5	82.5	80.1 84.9	74.1	73.1 75.1	1.1	0.9 1.3	1.2	1.0 1.5	0.2	0.1 0.3	0.2	0.1 0.4	4.46	4.36 4.56	4.0	3.8 4.2	3.44	3.24 3.64
385	2.63	2.56 2.70	26.1	25.8 26.4	82.2	79.9 84.5	73.8	72.9 74.7	0.9	0.7 1.1	0.9	0.6 1.1	0.1	0.1 0.2	0.1	0.1 0.2	4.46	4.37 4.55	3.9	3.7 4.1	3.27	3.07 3.47
411	2.65	2.55 2.75	25.9	25.6 26.2	82.7	79.1 86.3	75.5	74.2 76.8	0.9	0.7 1.1	1.2	0.9 1.5	0.1	0.1 0.1	0.2	0.1 0.4	4.31	4.17 4.45	4.7	3.9 4.5	3.50	3.26 3.74
356	2.71	2.64 2.78	25.8	25.5 26.1	80.3	78.1 82.5	76.7	75.8 77.6	1.0	0.8 1.2	1.2	0.9 1.5	0.2	0.1 0.3	0.2	0.1 0.3	4.28	4.20 4.36	4.6	4.4 4.8	3.40	3.21 3.59

*If the confidence limits for two regressed means overlap, the two means are not significantly different at the 5% level.

Table 1.—Two-year combined summary: Regressed means and 80% confidence limits for traits by stocks entered (Continued)

STOCK CODE	BREEDER'S NAME AND ADDRESS	BREEDING	STRAIN OR TRADENAME	NO. PENS / NO. LOCA-TIONS	AVG. CHICK PRICE (Cents)	MORTALITY GROWING (percent) RE-GRESSED MEAN	80%* CONF. LIMITS	MORTALITY LAYING (percent) RE-GRESSED MEAN	80%* CONF. LIMITS	AGE AT 50% PRODUCTION (days) RE-GRESSED MEAN	80%* CONF. LIMITS	EGG PRODUCTION HEN HOUSED (number) RE-GRESSED MEAN	80%* CONF. LIMITS	HEN-DAY (TO END OF TEST) (percent) RE-GRESSED MEAN	80%* CONF. LIMITS	HEN-DAY (LAST 30-60 DAYS) (percent) RE-GRESSED MEAN	80%* CONF. LIMITS
412	Ideal Plty. Br. Farm, Inc. Cameron, Texas 76520	Syn. x WL SX	Ideal 345-------	14 / 6	32.0	7.5	6.4 8.8	15.3	14.2 16.6	172	168 176	208	200 216	65.9	64.1 67.7	57.2	54.8 59.6
152	Indiana Farm Bureau Coop. Indianapolis, Ind. 46204	WL SX	Princess 55 ------	40 / 9	34.9	6.8	5.8 8.0	15.6	14.3 17.0	179	175 183	203	196 210	64.9	63.4 66.4	57.9	55.8 60.0
234	Indiana Farm Bureau Coop. Indianapolis, Ind. 46204	WL SX	Duchess 60--------	26 / 4	34.0	5.7	4.7 6.8	17.0	15.7 18.4	174	170 178	205	198 212	67.5	65.9 69.1	57.5	55.1 59.9
404	Jacobson Hatchery Hartley, Iowa 51346	WL SX	Basketfillers ------	12 / 3	38.0	6.1	5.1 7.2	15.5	14.3 16.8	169	165 173	203	196 210	64.9	63.1 66.7	56.2	53.8 58.6
110	Kimber Farms, Inc. Fremont, Calif. 94536	WL SX	Kimber K 137 ------	69 / 18	34.3	6.2	5.2 7.2	16.3	14.9 17.7	170	167 173	209	203 215	67.5	66.2 68.8	59.7	57.8 61.6
111	Kimber Farms, Inc. Fremont, Calif. 94536	WL SX	Kimber K-141 ------	58 / 20	34.5	6.6	5.6 7.7	17.4	16.0 18.9	172	169 175	204	197 211	65.9	64.5 67.3	57.3	55.4 59.2
112	Kimber Farms, Inc. Fremont, Calif. 94536	WL SX	Kimber K-155 ------	35 / 14	33.0	6.7	5.6 7.9	17.7	16.3 19.1	169	166 172	201	194 208	66.1	64.6 67.6	57.6	55.3 59.9
117	Lawton, A. C. & Sons Foxboro, Mass. 02035	RIRxWPR BX	Buff Sex Link------	27 / 10	34.0	5.5	4.5 6.6	13.6	12.3 14.9	175	171 179	189	182 196	57.9	56.4 59.4	52.2	49.9 54.5
415	Moyer's Chicks, Inc. Quakertown, Pa. 18951	CGxWL SX	Moyer MX 100------	4 / 2	36.0	6.3	5.4 7.2	16.1	15.1 17.1	168	164 172	205	197 213	64.9	62.9 66.9	0.0	0.0 0.0
37	N. Cent. Reg. Plty. Br. Lab Lafayette, Ind. 47907	WL PS	Reg. Cornell Contr.	51 / 12	40.8	9.5	8.2 10.8	18.2	16.8 19.7	181	178 184	183	177 189	62.5	61.0 64.0	55.0	53.0 57.0
409	N. Cent. Reg. Plty. Br. Lab Lafayette, Ind. 47907	WL SX	Kentville-Cornell--	24 / 10	30.0	7.0	5.9 8.3	16.8	15.5 18.1	178	175 181	185	178 192	60.8	59.1 62.5	52.9	50.5 55.3
352	Parks Poultry Farm Altoona, Pa. 16601	WL SX	Keystone B-1------	58 / 17	34.6	6.4	5.4 7.5	16.3	14.9 17.7	172	169 175	217	211 223	70.2	68.9 71.5	60.5	58.5 62.5

STOCK CODE	FEED PER POUND OF EGGS PRODUCED (pounds)		EGG WEIGHT (oz./doz.)		LARGE AND EXTRA LARGE EGGS (percent)		ALBUMEN QUALITY (Haugh units)		BLOOD SPOTS 1/8 INCH OR MORE (percent)		BLOOD SPOTS LESS THAN 1/8 INCH (percent)		MEAT SPOTS 1/8 INCH OR MORE (percent)		MEAT SPOTS LESS THAN 1/8 INCH (percent)		SPECIFIC GRAVITY SCORE		BODY WEIGHT (pounds)		INCOME OVER FEED AND CHICK COST (dollars)	
	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS
412	2.75	2.65 2.85	25.6	25.2 26.0	79.4	76.3 82.5	78.6	77.4 79.8	1.5	1.3 1.8	1.2	0.9 1.6	0.4	0.2 0.7	0.3	0.1 0.6	4.03	3.90 4.16	4.2	4.0 4.4	3.48	3.24 3.72
152	2.80	2.72 2.88	25.5	25.2 25.8	79.8	77.5 82.1	83.9	82.9 84.9	1.0	0.8 1.2	1.2	0.9 1.5	0.1	0.1 0.3	0.3	0.1 0.5	3.95	3.85 4.05	4.3	4.1 4.5	3.28	3.08 3.48
234	2.82	2.73 2.91	25.6	25.2 26.0	79.1	76.4 81.8	83.5	82.4 84.6	1.1	0.9 1.3	1.3	1.0 1.6	0.3	0.1 0.6	0.2	0.1 0.4	3.95	3.84 4.06	4.4	4.2 4.6	3.21	2.99 3.43
404	2.90	2.80 3.00	25.1	24.8 25.4	74.2	71.4 77.0	77.8	76.6 79.0	1.0	0.8 1.2	1.1	0.9 1.4	0.1	0.1 0.3	0.2	0.1 0.4	4.25	4.11 4.39	4.5	4.2 4.8	3.08	2.85 3.31
110	2.72	2.65 2.79	24.9	24.6 25.2	71.9	69.8 74.0	84.6	83.7 85.5	0.9	0.7 1.1	1.2	1.0 1.5	0.3	0.2 0.5	0.4	0.2 0.5	4.67	4.58 4.76	4.2	4.0 4.4	3.29	3.11 3.47
111	2.78	2.71 2.85	25.0	24.7 25.3	73.9	71.6 76.2	77.5	76.6 78.4	1.5	1.3 1.8	1.5	1.2 1.8	0.2	0.1 0.3	0.2	0.1 0.3	4.45	4.36 4.54	4.3	4.1 4.5	3.15	2.95 3.35
112	2.85	2.77 2.93	24.7	24.4 25.0	70.7	68.4 73.0	82.9	81.9 83.9	1.1	0.9 1.4	1.2	0.9 1.5	0.2	0.1 0.3	0.2	0.1 0.3	4.29	4.19 4.39	4.4	4.2 4.6	3.20	3.00 3.40
117	3.33	3.25 3.41	26.6	26.3 26.9	84.4	82.1 86.7	79.4	78.5 80.3	1.3	1.1 1.5	2.0	1.7 2.4	8.6	7.5 9.8	19.7	18.3 21.2	3.97	3.86 4.08	5.8	5.6 6.0	2.46	2.26 2.66
415	2.77	2.65 2.89	25.0	24.6 25.4	69.1	65.8 72.4	74.1	72.6 75.6	1.2	1.0 1.4	1.2	1.0 1.5	0.4	0.1 1.0	0.2	0.1 0.5	4.10	3.92 4.28	4.8	4.5 5.1	3.11	2.87 3.35
37	3.25	3.17 3.33	23.9	23.6 24.2	62.5	60.2 64.8	78.4	77.5 79.3	1.5	1.2 1.7	1.8	1.5 2.2	0.3	0.1 0.5	0.2	0.1 0.4	4.24	4.15 4.33	4.6	4.4 4.8	2.34	2.14 2.54
409	3.13	3.04 3.22	24.6	24.2 25.0	68.3	65.5 71.1	78.2	77.1 79.3	1.3	1.0 1.5	1.6	1.2 1.9	0.3	0.1 0.5	0.3	0.2 0.6	4.26	4.14 4.38	4.5	4.2 4.8	2.53	2.30 2.76
352	2.69	2.62 2.76	25.7	25.5 25.9	81.3	79.2 83.4	77.7	76.8 78.6	1.0	0.8 1.2	1.1	0.9 1.4	0.3	0.1 0.4	0.3	0.2 0.4	4.11	4.02 4.20	4.6	4.4 4.8	3.47	3.28 3.66

*If the confidence limits for two regressed means overlap, the two means are not significantly different at the 5% level.

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Table 1.—Two-year combined summary: Regressed means and 80% confidence limits for traits by stocks entered *(Continued)*

STOCK CODE	BREEDER'S NAME AND ADDRESS	BREEDING	STRAIN OR TRADE NAME	NO. PENS / NO. LOCATIONS	AVG. CHICK PRICE (Cents)	MORTALITY GROWING (percent) REGRESSED MEAN	80% CONF. LIMITS	MORTALITY LAYING (percent) REGRESSED MEAN	80% CONF. LIMITS	AGE AT 50% PRODUCTION (days) REGRESSED MEAN	80% CONF. LIMITS	HEN HOUSED (number) REGRESSED MEAN	80% CONF. LIMITS	EGG PRODUCTION HEN-DAY (TO END DF TEST) (percent) REGRESSED MEAN	80% CONF. LIMITS	HEN-DAY (LAST 30-60 DAYS) (percent) REGRESSED MEAN	80% CONF. LIMITS
382	Parks Poultry Farm, Altoona, Pa. 16601	RIRxWPR BX	Sil-Go-Links -------	10 / 3	34.0	5.4	4.5 6.5	16.4	15.2 17.6	170	167 173	191	183 199	59.9	58.1 61.7	55.8	53.3 58.3
566	St.Augustin Coop. Hatchery, St. Augustin, Quebec, Can.	WL SX	Corvett A-1 --------	14 / 4	36.0	5.1	4.1 6.1	15.3	14.1 16.6	170	166 174	210	202 218	65.9	64.2 67.6	57.1	54.8 59.4
181	Shaver Poultry Br. Farm, Galt, Ontario, Canada	WL SX	Starcross 288 ------	104 / 24	35.2	5.0	4.1 5.9	14.4	13.1 15.8	171	168 174	225	219 231	71.5	70.2 72.8	62.0	60.2 63.8
533	Starline Breeders Hatchery, Saskatoon, Sask., Canada	CGxWL BX	Pearlette ----------	14 / 4	40.0	5.0	4.0 6.1	15.7	14.5 17.0	169	165 173	203	196 210	64.0	62.3 65.7	53.5	51.2 55.8
416	Stone's Poultry Farm, Dinuba, Calif. 93618	WL SX	Stone H 56 E -------	12 / 5	35.2	6.5	5.4 7.7	16.1	14.9 17.3	169	166 172	203	195 211	65.2	63.4 67.0	57.8	55.4 60.2
336	Sturtevant Farms, Inc., Halifax, Mass. 02338	RIRxBPR BX	Black Sex Link -----	15 / 7	32.0	4.4	3.5 5.4	15.2	13.9 16.4	178	174 182	190	182 198	59.5	57.8 61.2	51.7	49.2 54.2
401	Tatum Farms, Dawsonville, Ga. 30534	WL SX	Tatum T-100 --------	70 / 16	38.8	8.0	6.9 9.2	15.8	14.5 17.2	169	166 172	209	203 215	67.3	66.0 68.6	58.0	56.1 59.9
407	Thornber's Plty.Br.Res.Dept., Retford, Nottingham, Eng.	WL SX	Thornber 808 -------	10 / 4	45.0	5.8	4.8 7.0	14.9	13.7 16.1	165	161 169	223	215 231	71.0	69.3 72.7	62.3	59.9 64.7
417	Tokai.Plty. Farm, Ltd., Retreat, C.P.,So.Africa	BAxWL BX	Tokai 65 -----------	8 / 2	35.0	5.2	4.4 6.0	14.6	13.6 15.7	170	166 174	202	194 210	63.0	61.0 65.0	55.7	53.2 58.2
410	Tokai.Plty. Farm, Ltd., Retreat, C.P.,So.Africa	WLxBA BX	Tokai 102 ----------	6 / 4	35.0	4.8	3.9 5.8	13.5	12.5 14.5	163	159 167	215	207 223	67.1	65.1 69.1	0.0	0.0 0.0
305	Warren, J. J., Inc., N. Brookfield, Mass. 01535	RIRxRIW BX	Sex-Sal-Link-F-----	13 / 6	37.5	5.2	4.3 6.3	13.4	12.2 14.6	176	172 180	207	199 215	64.2	62.6 65.8	53.2	50.7 55.7
290	Welp's Breeding Farm, Bancroft, Iowa 50517	WL SX	Welp Line 937 ------	78 / 18	36.0	5.6	4.7 6.6	15.4	14.1 16.8	165	162 168	211	205 217	66.8	65.4 68.2	56.1	54.2 58.0

STOCK CODE	FEED PER POUND OF EGGS PRODUCED (pounds)		EGG WEIGHT (oz./doz.)		LARGE AND EXTRA LARGE EGGS (percent)		ALBUMEN QUALITY (Haugh units)		BLOOD SPOTS 1/8 INCH OR MORE (percent)		BLOOD SPOTS LESS THAN 1/8 INCH (percent)		MEAT SPOTS 1/8 INCH OR MORE (percent)		MEAT SPOTS LESS THAN 1/8 INCH (percent)		SPECIFIC GRAVITY SCORE		BODY WEIGHT (pounds)		INCOME OVER FEED AND CHICK COST (dollars)	
	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS	RE-GRESSED MEAN	80%* CONF. LIMITS
382	3.17	3.08 / 3.26	26.8	26.5 / 27.1	88.6	85.8 / 91.4	78.5	77.4 / 79.6	1.2	1.0 / 1.5	1.9	1.5 / 2.2	4.0	3.0 / 5.1	16.4	14.5 / 18.4	3.82	3.68 / 3.96	5.9	5.7 / 6.1	2.51	2.29 / 2.73
566	2.75	2.66 / 2.84	25.3	24.9 / 25.7	75.1	72.4 / 77.8	79.7	78.6 / 80.8	0.9	0.7 / 1.1	1.0	0.7 / 1.3	0.3	0.1 / 0.7	0.2	0.1 / 0.4	4.42	4.29 / 4.55	4.4	4.1 / 4.7	3.28	3.06 / 3.50
181	2.66	2.59 / 2.73	26.0	25.7 / 26.3	83.0	80.9 / 85.1	78.5	77.6 / 79.4	0.9	0.7 / 1.1	1.1	0.8 / 1.3	0.2	0.1 / 0.3	0.3	0.2 / 0.4	4.13	4.05 / 4.21	4.6	4.4 / 4.8	3.63	3.45 / 3.81
533	2.97	2.88 / 3.06	25.5	25.1 / 25.9	74.8	72.2 / 77.4	76.1	75.0 / 77.2	1.0	0.8 / 1.2	1.2	0.9 / 1.5	0.4	0.2 / 0.7	0.3	0.1 / 0.6	3.95	3.82 / 4.08	5.0	4.8 / 5.2	2.87	2.65 / 3.09
416	2.80	2.70 / 2.90	25.4	25.0 / 25.8	76.9	74.0 / 79.8	78.7	77.4 / 80.0	0.7	0.5 / 0.8	1.3	1.0 / 1.6	0.1	0.1 / 0.3	0.2	0.1 / 0.4	4.22	4.08 / 4.36	4.6	4.3 / 4.9	3.13	2.90 / 3.36
336	3.19	3.10 / 3.28	26.4	26.0 / 26.8	81.6	79.1 / 84.1	78.9	77.7 / 80.1	1.1	0.9 / 1.3	2.3	1.9 / 2.7	7.5	6.3 / 8.8	12.3	10.9 / 13.8	3.66	3.53 / 3.79	5.9	5.7 / 6.1	2.61	2.40 / 2.82
401	2.72	2.65 / 2.79	25.1	24.8 / 25.4	75.6	73.4 / 77.8	78.0	77.2 / 78.8	1.7	1.4 / 1.9	1.6	1.3 / 1.9	0.3	0.1 / 0.4	0.3	0.2 / 0.4	4.19	4.10 / 4.28	4.3	4.1 / 4.5	3.27	3.07 / 3.47
407	2.62	2.53 / 2.71	24.4	24.1 / 24.7	65.4	62.6 / 68.2	75.7	74.5 / 76.9	0.7	0.5 / 0.8	0.7	0.5 / 0.9	0.1	0.1 / 0.3	0.2	0.1 / 0.5	4.05	3.91 / 4.19	4.1	3.9 / 4.3	3.44	3.22 / 3.66
417	3.06	2.96 / 3.16	25.5	25.1 / 25.9	78.6	75.3 / 81.9	77.8	76.4 / 79.2	1.0	0.8 / 1.2	1.1	0.8 / 1.4	12.3	10.3 / 14.5	8.7	7.0 / 10.5	4.23	4.08 / 4.38	5.3	5.0 / 5.6	0.0	0.0 / 0.0
410	2.90	2.80 / 3.00	24.2	23.8 / 24.6	61.1	58.0 / 64.2	78.5	77.2 / 79.8	1.0	0.9 / 1.2	1.7	1.4 / 2.1	2.2	1.4 / 3.2	4.9	3.7 / 6.2	3.89	3.73 / 4.05	5.0	4.8 / 5.2	3.15	2.92 / 3.38
305	2.92	2.83 / 3.01	26.4	26.0 / 26.8	85.7	83.1 / 88.3	79.6	78.5 / 80.7	1.1	0.9 / 1.3	2.3	1.9 / 2.8	3.0	2.2 / 3.9	8.6	7.4 / 10.0	3.79	3.66 / 3.92	5.5	5.3 / 5.7	3.14	2.92 / 3.36
290	2.75	2.68 / 2.82	24.7	24.4 / 25.0	69.9	67.8 / 72.0	78.3	77.4 / 79.2	1.0	0.8 / 1.2	1.1	0.9 / 1.4	0.1	0.1 / 0.3	0.1	0.1 / 0.2	4.17	4.09 / 4.25	3.9	3.8 / 4.0	3.29	3.10 / 3.48

*If the confidence limits for two regressed means overlap, the two means are not significantly different at the 5% level.

Statistical Methods

The 2-year combined summary includes performance data on 39 stocks that were entered in both the 1968-69 and 1969-70 tests and on 9 stocks that were entered only in the 1969-70 tests. Birds were tested at 24 locations in 1968-69 and at 23 locations in 1969-70. Table 3 lists the locations. Certain traits were not measured at some of the locations. These are identified with an NR (not reported) in the appropriate columns in table 3.

Replicate data were reported by 17 locations in 1968-69 and by 16 locations in 1969-70. In addition, three locations in each test year tested the stock in replicate pens, but the number of birds per replicate was too small for a valid analysis. Consequently, the replicate data were combined by entries within each of these locations, and the resulting entry average was used in the computations. This was done to more nearly equalize the variance among pens throughout all tests. The number of pens and the number of stocks tested at each location for the 2 years are given in table 3.

The percentage data for both years for the six traits—growing mortality, laying mortality, large blood spots, small blood spots, large meat spots, and small meat spots—were converted to angles with the arcsin transformation prior to analysis. However, the test-year adjustment factors shown in table 3 and the regressed means and confidence limits shown for these traits in table 1 are given in percent.

The replicate data were analyzed by least-squares procedures to obtain the test-year adjustment factors shown in table 3 and the repeatability estimates and the correlations among pens within tests shown in table 2. The test-year adjustment factors were then used to adjust the simple stock average for test and year effects. The adjusted stock averages (the least-squares stock means) were then regressed toward the overall mean ($\hat{\mu}$) to account for variations in number of tests entered, number of years entered, and number of replicates per test. The formula used to compute the regressed mean is:

$$\text{Regressed Mean} = \hat{\mu} + \frac{r_{2/C}}{1+(k_3-1)x_1+(k_1-k_3)x_2+(k_2-k_3)r_1+[(1/C)-k_1-k_2+k_3]r_2}(\hat{s})$$

where:

$\hat{\mu}$ = the average of the test and year adjusted stock means.

r_1 = repeatability within year.

r_2 = repeatability from year-to-year.

x_1 = the correlation among replicates within year and test.

x_2 = the correlation among pens of the same stock from year-to-year for the same test.

k_1 = an average of the number of pens per test (averaged over years).

k_2 = an average of the number of pens per year (averaged over tests).

k_3 = an average of the number of replicates per test-year subclass.

C = the diagonal inverse element for that stock. The reciprocal of C, i.e., $\frac{1}{C}$, is equal to nk_3 if the assumption is made that the adjustments for test-year effects are made without error; where n is the number of test-year subclasses in which that stock is entered.

s = the test-year adjusted stock average minus the overall mean $\hat{\mu}$.

The correlations used in computing the regression coefficient were obtained from estimates of the variance components for stocks ($\hat{\sigma}^2_s$), the stock-X-test interaction ($\hat{\sigma}^2_{st}$), the stock-X-year interaction ($\hat{\sigma}^2_{sy}$), and the random error ($\hat{\sigma}^2_e$). The variance component estimates were obtained by equating the computed mean squares for these effects to their expectations. The mean square for stocks was adjusted for the test-year subclass by least-squares procedures for the effects of stocks and the test-year subclasses. The three-factor interaction was assumed to be non-existent. Ratios of the variance component estimates that were used to compute the correlations follow:

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Correlation Among Replicates $= x_1 = \dfrac{\hat{\sigma}^2_s + \hat{\sigma}^2_{st} + \hat{\sigma}^2_{sy}}{\hat{\sigma}^2_s + \hat{\sigma}^2_{st} + \hat{\sigma}^2_{sy} + \hat{\sigma}^2_e}$

Correlation from Year-to-Year (same test) $= x_2 = \dfrac{\hat{\sigma}^2_s + \hat{\sigma}^2_{st}}{\hat{\sigma}^2_s + \hat{\sigma}^2_{st} + \hat{\sigma}^2_{sy} + \hat{\sigma}^2_e}$

Repeatability from Test-to-Test (within year) $= r_1 = \dfrac{\hat{\sigma}^2_s + \hat{\sigma}^2_{sy}}{\hat{\sigma}^2_s + \hat{\sigma}^2_{st} + \hat{\sigma}^2_{sy} + \hat{\sigma}^2_e}$

Repeatability from Test-to-Test (between years) $= r_2 = \dfrac{\hat{\sigma}^2_s}{\hat{\sigma}^2_s + \hat{\sigma}^2_{st} + \hat{\sigma}^2_{sy} + \hat{\sigma}^2_e}$

An approximate standard error (SE) was computed for each regressed mean as follows:

$$SE = b \sqrt{C(\hat{\sigma}^2_e + k_1 \hat{\sigma}^2_{st} + k_2 \hat{\sigma}^2_{sy})}$$

where b is the regression coefficient given above in the formula for the regressed mean. Confidence limits were then computed for each regressed mean as follows:

Regressed Mean $\pm$ 1.3 SE

The constant 1.3 was selected in order that the probability of the confidence limits overlapping by chance alone between any two means would be about 0.03. This makes the test of significance among regressed means almost comparable to using Duncan's range test at the 0.05 level of probability.

Definitions of Statistical Terms

The following definitions will help the reader interpret the analytical procedures:

Overall mean — The average of the test-year adjusted means for all stocks. This is an estimate of what the overall average would have been had all stocks been entered in all tests in both years.

Range — The range represents the difference between the expected maximum and minimum performance among the 61* stocks, based on the regressed means.

Common stocks — Stocks that are being tested at more than one location.

Test-year adjustment factor. — The amount added to or subtracted from the actual performance of the stocks at a given location in a given year to bring them to the average of all the location-year sub-classes that had complete data. These factors were determined on an intrastock basis with a least-squares analysis, and they are given in table 3.

Repeatability within year — An intraclass correlation that measures the tendency for common stocks to rank the same from test-to-test within year. Theoretically, it can vary from 0.00 to 1.00.

Repeatability between years — A correlation which measures the tendency for common stocks to rank the same from test-to-test from one year to another. The difference between the repeatability within year and repeatability between years indicates the relative importance of the stock-by-year interaction.

Correlation among replicates — This correlation measures the repeatability among replicates of the same stock in the same test and year. The higher the correlation among replicates the less need there is for replication of stocks within test and year.

Correlation from year-to-year within tests — A correlation which measures the tendency for common stock to rank the same from year-to-year when tested at the same location. The difference in the repeatability between years and in the correlation from year-to-year within tests indicates the relative importance of the stock-by-test interaction.

Confidence limits — The confidence limits for each regressed mean are computed so that the probability is about 0.08 that the "true" stock mean lies within the interval. They are presented in this report, however, for the purpose of providing approximate tests of significance for differences among stocks.

*Includes 9 experimental stocks.

Table 2.--Analytical data for the traits measured

Test	Overall means	Regressed means		Repeatability		Correlations within test	
		Min.	Max.	Within year (r_1)	Year-to-year (r_2)	Among replicates (x_1)	Year-to-year (x_2)
Growing mortality .... percent..	5.5	3.3	10.0	0.1681	0.1223	0.1681	0.1223
Laying mortality .... percent..	15.1	11.7	18.2	.1488	.0578	.2607	.1697
Age at 50 percent production .. days..	171.7	163	182	.5271	.4473	.6883	.6085
Hen-housed egg production. number..	206.7	183	225	.3309	.2618	.4545	.3853
Hen-day egg production to end of test................. percent..	65.5	57.9	71.5	.5331	.4654	.6246	.5570
Hen-day egg production last 30 to 60 days.............. percent..	56.4	48.7	62.9	.3389	.2779	.4411	.3802
Feed per pound of eggs ..... pounds..	2.86	2.57	3.33	.6274	.5715	.7278	.6720
Egg weight.......... ounces/dozen..	25.3	23.9	27.1	.7520	.7009	.8244	.7733
Large and extra large eggs. percent..	75.8	61.1	88.8	.7237	.6576	.8442	.7781
Albumen quality ...... Haugh units..	78.8	73.8	84.6	.7073	.6569	.7574	.7070
Large blood spots......... percent..	1.1	.7	1.7	.0902	.0685	.2621	.2404
Small blood spots .... percent..	1.3	.7	2.6	.1419	.1102	.3108	.2791
Large meat spots .... percent..	.6	.1	12.3	.6723	.6723	.7835	.7638
Small meat spots .... percent..	1.2	.1	22.6	.8493	.8443	.8875	.8825
Specific gravity............. score..	4.14	3.28	4.80	.5769	.5603	.6212	.6046
Body weight.............. pounds..	4.6	3.7	5.9	.8880	.8578	.9216	.8914
Income over feed and chick cost.................. dollars..	3.15	2.34	3.63	.4325	.3392	.6149	.5216

NOTE: The values for these factors are based on the 48 commercially available stocks as well as the 13 experimental stocks that were tested. The individual performance data for the experimental entries were analyzed but not published in this report.

Table 3. -- Factors used to adjust for test differences

Test	Pens (number)		Stocks tested (number)		Mortality (percent) Growing period		Laying period	
	1969	1970	1969	1970	1969	1970	1969	1970
California No. 1 --------------	76	--	19	--	+3.61	----	+1.51	----
Central Canada No. 1 - Floor---	34	--	17	--	+ .49	----	- .01	----
Central Canada No. 5 - (1/cage)-	68	--	17	--	+ .50	----	+ .02	----
Central Canada No. 6 - (2/cage)-	--	48	--	12	----	+0.45	----	+0.78
Central Canada No. 7 - (2/cage)-	--	48	--	12	----	+ .45	----	+ .52
Florida No. 1 - Floor----------	48	48	12	12	+ .38	+ .02	-1.68	+ .82
Florida No. 2 - (2/cage) -------	48	48	12	12	+ .38	+ .02	-2.61	+ .04
Minnesota No. 1 - Floor -------	16	14	16	14	+ .05	+ .27	+ .32	+1.24
Minnesota No. 4 - (3/cage)-----	48	42	16	14	+ .05	+ .27	+ .05	+ .37
Missouri - Cage (8/cage)-------	90	108	15	18	+ .01	- .20	+ .62	- .34
Missouri - Floor--------------	96	100	24	25	+ .11	-5.03	+ .82	-2.38
New Hampshire No. 2 (6/cage)-	15	--	15	--	- .91	----	-1.26	----
New Hampshire No. 4 - Floor--	17	14	17	14	- .19	- .01	- .16	+ .01
New Hampshire No. 6 - (2/cage)-	17	--	17	--	- .19	----	- .03	----
New Hampshire No. 7 - (3/cage)-	--	42	--	14	----	NR*	----	+ .01
New Jersey -------------------	12	11	12	11	+ .74	+ .39	+1.28	+ .79
North Carolina No. 2 - Slat -----	40	40	20	20	+ .63	- .25	+ .04	- .74
North Carolina No. 3 - Floor ---	40	40	20	20	- .49	+ .30	-2.65	+ .24
North Carolina No. 4 - (2/cage)-	80	80	20	20	+ .01	+ .01	+ .03	- .01
Pennsylvania No. 1 - Floor -----	48	48	24	24	+ .36	+2.03	+1.83	- .08
Pennsylvania No. 2 - (3/cage)---	--	48	--	24	----	+2.03	----	- .01
Tennessee No. 1 - (1/cage) -----	14	14	14	14	- .48	+1.40	- .01	+ .12
Tennessee No. 2 - (2/cage) -----	28	28	14	14	- .48	+1.40	- .02	+ .11
Tennessee No. 3 - (1/cage) -----	14	14	14	14	- .48	+1.40	- .03	+ .05
Tennessee No. 4 - (2/cage) -----	28	28	14	14	- .48	+1.40	- .01	+ .12
Texas No. 2 - (2/cage)----------	26	28	12	14	- .57	-1.40	+ .07	-1.22
Texas No. 3 - (2/cage)----------	26	28	12	14	- .57	-1.40	+ .28	-1.22
Texas No. 4 - (2/cage)----------	25	28	12	14	- .57	-1.40	+ .05	- .80

* Data for this trait not reported.

Table 3.--Factors used to adjust for test differences--Continued

Test	Age at 50 percent production (days)		Egg production					
			Hen-housed (number)		Hen-day (to end of test) (percent)		Hen-day (last 30-60 days) (percent)	
	1969	1970	1969	1970	1969	1970	1969	1970
California No. 1 -----------------	-13.01	-----	-40.85	-----	+ 4.30	-----	NR*	-----
Central Canada No. 1 - Floor ----	+ 1.95	-----	+ .22	-----	- 1.91	-----	+ 1.64	-----
Central Canada No. 5 - (1/cage) -	+ 1.28	-----	- 2.42	----	- 2.32	-----	- .36	-----
Central Canada No. 6 - (2/cage) -	-----	+ 2.61	-----	-11.69	-----	- 2.89	-----	- 1.73
Central Canada No. 7 - (2/cage) -	-----	- 3.46	-----	- 9.98	-----	- 3.45	-----	- 2.01
Florida No. 1 - Floor ----------	+ 9.76	+17.89	-15.24	-50.43	- 1.72	- 2.33	+ .23	+2.95
Florida No. 2 - (2/cage)--------	+ 9.49	+17.05	- 6.73	-34.69	- .31	- .25	+ 1.08	+4.83
Minnesota No. 1 - Floor --------	- 8.46	- 9.48	- 3.51	+32.53	+ 1.19	+ 6.32	+ 3.72	-1.21
Minnesota No. 4 - (3/cage) -----	+ .73	-23.91	+ 4.79	+39.82	+ 3.25	+ 7.57	+ 7.78	-7.04
Missouri - Cage (8/cage) -------	-12.59	-15.51	+ 1.25	+ 9.99	- 1.71	- 4.64	NR*	-3.96
Missouri - Floor ---------------	+ 6.99	-16.09	-22.34	+39.41	- 4.01	- 2.21	NR*	-2.04
New Hampshire No. 2 - (6/cage) -	- 4.86	-----	+21.97	-----	+ 1.33	-----	- 2.75	-----
New Hampshire No. 4 - Floor---	+ 2.05	+ 2.49	+ 2.22	-21.95	- 2.35	-10.46	- 4.05	NR*
New Hampshire No. 6 - (2/cage)--	+ 2.58	-----	+ 2.65	-----	- .87	-----	- 1.77	-----
New Hampshire No. 7 - (3/cage) -	-----	+ .84	-----	+ 3.40	-----	- 2.29	-----	NR*
New Jersey --------------------	+ 7.32	+ 8.34	-26.89	-27.79	- 3.54	- 4.15	- 6.13	-2.93
North Carolina No. 2 - Slat ------	- 2.68	- 6.46	+ .66	+15.04	- 1.93	- 3.24	- .67	-2.34
North Carolina No. 3 - Floor-----	- 2.56	- 2.06	+10.79	-16.89	- 4.61	- 7.84	- 5.03	-4.78
North Carolina No. 4 - (2/cage) --	- 1.96	- 2.00	+ 4.90	+ 3.23	- 1.48	- 3.00	- .30	-1.74
Pennsylvania No. 1 - Floor ------	+10.37	+ 4.62	-35.58	- 7.95	- 6.45	- 3.50	- 7.48	NR*
Pennsylvania No. 2 - (3/cage) ---	-----	+ 3.58	-----	- 3.40	-----	- .39	-----	NR*
Tennessee No. 1 - (1/cage) ------	+ 8.08	+12.43	- 2.78	-11.97	+ 2.55	+ 1.26	+ 3.82	NR*
Tennessee No. 2 - (2/cage) -----	+ 7.16	+ 7.70	+ 1.24	- 1.95	+ 3.22	+ 3.67	+ 5.56	NR*
Tennessee No. 3 - (1/cage) -----	+ 6.30	+ 9.71	- 5.66	- 8.97	+ 2.69	+ 2.74	+ 5.74	NR*
Tennessee No. 4 - (2/cage) -----	+ 8.26	+11.15	+ .16	- 5.94	+ 3.73	+ 3.17	+ 5.51	NR*
Texas No. 2 - (2/cage) ---------	- 9.96	-11.00	+ 9.27	+38.25	+ 4.72	+ 4.67	+ 3.03	+1.18
Texas No. 3 - (2/cage) ---------	- 9.84	-11.84	+ 6.86	+38.49	+ 3.99	+ 4.97	+ 2.47	+ .73
Texas No. 4 - (2/cage) ---------	-10.15	-11.32	+12.56	+35.80	+ 4.93	+ 4.57	+ 3.10	+1.06

* Data for this trait not reported.

Table 3.--Factors used to adjust for test differences--Continued

Test	Feed per pound of eggs (pounds)		Egg weight (oz. /dozen)		Large and extra large eggs (percent)		Albumen quality (Haugh units)	
	1969	1970	1969	1970	1969	1970	1969	1970
California No. 1 --------------	- .03	----	- .14	----	-10.16	----	NR*	----
Central Canada No. 1 - Floor---	- .18	----	- .09	----	+10.31	----	+ 6.65	----
Central Canada No. 5 - (1/cage)-	- .08	----	- .39	----	+ 4.95	----	+ 5.66	----
Central Canada No. 6 - (2/cage)-	----	+ .17	----	- .16	----	+ 6.84	----	+ 4.74
Central Canada No. 7 - (2/cage)-	----	+ .14	----	+ .07	----	+ 9.58	----	+ 3.66
Florida No. 1 - Floor----------	+ .18	+ .08	+ .68	+1.06	+ 9.68	+10.62	- 2.83	+ 4.66
Florida No. 2 - (2/cage)--------	+ .24	+ .09	+ .09	+ .49	+ 2.43	+ 4.84	- 2.61	+ 6.38
Minnesota No. 1 - Floor--------	- .29	- .57	- .34	+ .42	- 7.36	- .95	- 8.38	-12.20
Minnesota No. 4 - (3/cage)------	- .17	- .42	- .23	- .07	- 7.38	- 4.50	- 7.10	-10.94
Missouri - Cage (8/cage)--------	- .13	+ .10	- .38	- .28	-10.15	-10.60	- 1.34	+ .88
Missouri - Floor---------------	+ .06	+ .07	+1.06	+ .47	+ 1.11	- 2.64	- .05	+ 1.81
New Hampshire No. 2 - (6/cage)-	- .71	----	+ .27	----	+ 3.04	----	+11.39	----
New Hampshire No. 4 - Floor	+ .03	+ .34	+ .03	+ .02	- 1.21	+ 6.52	+ 8.19	+ 5.03
New Hampshire No. 6 - (2/cage)-	+ .14	----	- .20	----	- 3.17	----	+ 7.68	----
New Hampshire No. 7 - (3/cage)-	----	+ .23	----	+ .45	----	- .31	----	+ 5.48
New Jersey--------------------	+ .02	+ .26	+ .01	-1.53	+ 8.38	+ 7.30	- 3.10	- 3.32
North Carolina No. 2 - Slat------	+ .04	+ .13	-1.53	-1.75	-14.41	-12.77	+ 3.38	+ 2.50
North Carolina No. 3-	+ .20	+ .27	-1.02	-1.11	-11.86	- 9.83	+ 5.01	+ 2.86
North Carolina No. 4 - (2/cage) -	+ .33	+ .29	-1.74	-1.84	-14.48	-12.73	+ 4.95	+ 1.37
Pennsylvania No. 1 - Floor------	+ .26	- .23	- .07	+ .20	+ 8.62	+14.99	+ 2.76	- .03
Pennsylvania No. 2 - (3/cage)----	----	- .46	----	- .06	----	+13.02	----	+ .36
Tennessee No. 1 - (1/cage)-------	- .18	- .03	+ .71	+ .07	+ 7.78	+ 2.24	+ .57	+ 4.96
Tennessee No. 2 - (2/cage)-------	- .09	- .07	+ .55	- .23	+ 7.25	- 1.94	+ 3.12	+ 3.65
Tennessee No. 3 - (1/cage)-------	- .21	- .01	+1.10	+ .17	+11.11	+ 5.62	+ 1.29	+ 3.13
Tennessee No. 4 - (2/cage)-------	- .14	- .06	+1.00	+ .12	+11.73	+ 2.61	+ 2.53	+ 4.76
Texas No. 2 - (2/cage)-----------	- .04	- .10	+ .34	+1.04	NR*	NR*	- 4.21	- 3.06
Texas No. 3 - (2/cage)-----------	- .01	- .10	+ .36	+ .90	NR*	NR*	- 4.08	- 3.02
Texas No. 4 - (2/cage)-----------	- .06	- .07	+ .24	+1.03	NR*	NR*	- 4.10	- 3.42

* Data for this trait not reported.

Table 3.--Factors used to adjust for test differences--Continued

Test	Blood spots 1/8 inch or more (percent)		Blood spots less than 1/8 inch (percent)		Meat spots 1/8 inch or more (percent)		Meat spots less than 1/8 inch (percent)	
	1969	1970	1969	1970	1969	1970	1969	1970
California No. 1 --------------	NR*	----	NR*	----	NR*	----	NR*	----
Central Canada No. 1 - Floor ---	+ .07	----	- .03	----	+ .07	----	- .01	----
Central Canada No. 5 - (1/cage) -	- .03	----	- .31	----	+ .04	----	- .04	----
Central Canada No. 6 - (2/cage) -	----	+ .01	----	- .13	----	+ .12	----	- .02
Central Canada No. 7 - (2/cage) -	----	+ .02	----	- .04	----	+ .15	----	- .02
Florida No. 1 - Floor -----------	- .14	- .01	- .27	- .02	+ .04	- .01	+ .17	+ .01
Florida No. 2 - (2/cage)---------	- .32	- .08	- .27	- .09	+ .05	- .02	+ .17	+ .01
Minnesota No. 1 - Floor---------	+ .02	- .13	+ .01	+ .02	- .11	+ .11	+ .23	+ .16
Minnesota No. 4 - (3/cage)-------	+ .01	- .02	+ .16	- .11	- .07	+ .03	+ .14	+ .16
Missouri - Cage (8/cage)---------	- .07	- .05	- .34	- .46	+ .01	+ .09	- .08	- .04
Missouri - Floor ----------------	+ .01	+ .01	- .06	- .17	+ .04	+ .07	- .04	+ .07
New Hampshire No. 2 - (6/cage) -	- .01	----	+ .17	----	- .29	----	- .03	----
New Hampshire No. 4 - Floor ----	+ .23	+ .19	+ .11	+ .72	-1.62	- .17	- .08	- .81
New Hampshire No. 6 - (2/cage)--	+ .08	----	+ .41	----	- .99	----	- .49	----
New Hampshire No. 7 - (3/cage)--	----	+ .82	----	+ .54	----	+ .14	----	- .42
New Jersey --------------------	+ .07	+ .20	- .01	- .01	- .07	+ .08	-1.03	-1.78
North Carolina No. 2 - Slat ------	- .01	+ .01	- .01	- .02	- .02	+ .01	- .07	- .27
North Carolina No. 3 ------------	- .02	+ .01	- .03	- .03	- .12	- .01	- .11	- .14
North Carolina No. 4 - (2/cage)---	- .05	- .01	- .08	- .03	- .03	+ .01	- .12	- .02
Pennsylvania No. 1 - Floor -------	+ .11	+ .07	+ .04	+ .01	+ .39	+ .30	+ .38	+ .15
Pennsylvania No. 2 - (3/cage)-----	----	+ .03	----	- .03	----	+ .34	----	+ .09
Tennessee No. 1 - (1/cage)--------	+ .01	+ .13	+ .01	+ .03	+ .06	+ .12	+ .10	+ .09
Tennessee No. 2 - (2/cage)--------	+ .06	+ .35	+ .16	+ .02	+ .07	+ .09	+ .10	+ .19
Tennessee No. 3 - (1/cage)--------	+ .03	+ .05	+ .03	+ .40	+ .13	+ .15	+ .24	+ .16
Tennessee No. 4 - (2/cage)--------	+ .01	+ .11	+ .01	+ .01	+ .08	+ .06	+ .09	+ .15
Texas No. 2 - (2/cage)------------	- .02	- .02	+ .02	+ .18	- .26	- .10	- .05	- .01
Texas No. 3 - (2/cage)------------	- .22	- .04	- .02	+ .17	- .23	- .05	+ .01	- .03
Texas No. 4 - (2/cage)------------	- .01	- .12	- .01	+ .04	- .14	- .12	- .02	+ .01

* Data for this trait not reported.

Table 3.--Factors used to adjust for test differences--Continued

Test	Specific gravity score		Body weight (pounds)		Income over feed and chick cost (dollars)	
	1969	1970	1969	1970	1969	1970
California No. 1 --------------	NR*	----	-0.28	----	+0.72	----
Central Canada No. 1 - Floor --	+0.92	----	- .27	----	+1.69	----
Central Canada No. 5 - (1/cage)-	+ .56	----	- .42	----	+1.38	----
Central Canada No. 6 - (2/cage)-	----	+0.90	----	-0.10	----	+0.24
Central Canada No. 7 - (2/cage)-	----	+ .76	----	- .03	----	+ .28
Florida No. 1 - Floor ----------	-1.59	- .32	- .12	- .02	NR*	NR*
Florida No. 2 - (2/cage)--------	-1.94	- .54	+ .06	+ .10	NR*	NR*
Minnesota No. 1 - Floor --------	-2.09	- ..33	- .07	- .20	+1.28	+1.35
Minnesota No. 4 - (3/cage) -----	-2.12	- .15	- .03	- .14	+1.18	+1.44
Missouri - Cage (8/cage) -------	- .01	+ .10	- .29	- .15	+ .61	-1.03
Missouri - Floor --------------	+ .56	+ .12	+ .27	+ .23	- .82	- .43
New Hampshire No. 2 - (6/cage)-	+1.71	----	- .20	----	- .28	----
New Hampshire No. 4 - Floor ---	+1.52	+1.76	- .20	- .17	-1.49	-2.63
New Hampshire No. 6 - (2/cage)-	+1.18	----	- .28	----	-1.70	----
New Hampshire No. 7 - (3/cage)-	----	+1.20	----	- .24	----	-1.81
New Jersey -------------------	-1.18	-1.33	+ .02	+ .06	- .68	-1.79
North Carolina No. 2 - Slat -----	+1.76	+1.67	+ .11	- .10	+2.10	+1.57
North Carolina No. 3 - Floor ---	+1.82	+1.76	+ .06	- .16	+1.96	+ .64
North Carolina No. 4 - (2/cage)-	+1.72	+1.35	- .03	- .13	+1.77	+1.04
Pennsylvania No. 1 - Floor -----	- .88	- .24	- .03	- .01	- .54	+ .17
Pennsylvania No. 2 - (3/cage)---	----	- .15	----	- .11	----	+ .41
Tennessee No. 1 - (1/cage)------	+ .46	+ .90	- .18	- .11	- .20	-1.20
Tennessee No. 2 - (2/cage)------	+ .75	+1.00	+ .09	- .13	- .15	- .98
Tennessee No. 3 - (1/cage)------	+ .46	+ .70	- .06	- .06	- .40	-1.28
Tennessee No. 4 - (2/cage)------	+ .71	+1.19	+ .09	+ .12	- .33	-1.17
Texas No. 2 - (2/cage)----------	-1.31	-1.22	+ .19	+ .30	NR*	NR*
Texas No. 3 - (2/cage)----------	-1.34	-1.21	+ .13	+ .20	NR*	NR*
Texas No. 4 - (2/cage)----------	-1.36	-1.17	+ .07	+ .24	NR*	NR*

* Data for this trait not reported.

How Group Rankings Were Determined for Each Trait

The information in this section deals only with the test data obtained during the 1969-70 test year.

The performance of each entry in the 11 Random Sample Egg Production Tests conducted during 1969-70 is reported as the Range Group Rank of the entry for the trait measured. These rankings were determined in the following manner. For each trait the entries in each test were alined in descending order of performance from the most desirable to the least desirable. The "mean" or average performance for the trait was then determined. All entries above the mean are in range group 1 or 2, and those below the mean are in range group 3 or 4. The dividing point for the entries above or below the mean is the midpoint of the range between the mean and the top or bottom entry. An illustration follows.

Stocks entered in the New Jersey test had a mean, or average, of 240.55 eggs for the trait "Egg Production per Hen Housed." The highest average number of eggs laid by an entry in this test was 259.00, and the lowest average number laid by an entry was 209.00 eggs. To arrive at the dividing point between the first and second range groups, the mean (240.55) was subtracted from the highest number of eggs (259.00). The result, 18.45 eggs, was divided by two to get the midpoint of the range (9.23 eggs). This was subtracted from the highest number of eggs (259.00 minus 9.23) to arrive at the dividing point (249.77 eggs) between the first and second range groups. To determine the dividing point between the third and fourth range groups, the same procedure was used, except that the lowest average number of eggs (209.00) was subtracted from the mean (240.55). This difference, or range, (31.55 eggs) was then divided by two, and the result (15.78 eggs) was subtracted from the mean (240.55 minus 15.78) to get the dividing point (224.77 eggs) between the third and fourth range groups. These determinations for each trait and test are tabulated in table 4.

The breeders of the stock tested and the Range Group Ranking, by traits, of each entry of the stock are shown in table 5. Each entry is also identified by the abbreviated name of the entrant. If the sample was drawn from a source other than the entrant's hatchery or supply flock, the abbreviated name of the source of the sample is shown in parentheses following the entrant's name.

The listing of the entries in the four range groups, with all entries of each stock in one table, allows the reader to quickly evaluate a stock based on this method of analysis. It should be kept in mind, however, that this method provides just four broad classifications. One-tenth of an egg or one-tenth of a percent difference in mortality could move an entry up or down one Range Group Rank, depending on its place in the range grouping.

Tabular Listing of Stock Entered in Tests

The listing of all stock entered in the 1969-70 Random Sample Egg Production Tests is given in table 6. This listing will permit the reader to see at a glance the abbreviated name of the breeder of the stock, the strain or trade name of the stock, and the total number of entries of each stock which were tested during 1969-70. The tests in which each stock was entered are also given. The full name and address of the breeder can be found in table 1.

Management and Environmental Conditions at Tests

Some of the more important management and environmental conditions found in the individual tests during the 1969-70 testing year are found in table 7. Other conditions at the various testing stations were undoubtedly different. However, the important consideration is that all entries at a given location were treated as nearly alike as possible.

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Table 4. --Upper and lower limits for each range group by traits and tests, 1969-70

Traits measured	Tests			
	Central Canada	Florida	Minnesota	Missouri Cage
Income over feed and chick cost;				
Average - - - dol./hen housed -	2.983	-----	1.984	4.279
Range group 1 - - - - - - - - - -	3.630 - 3.307	----- -----	2.190 - 2.087	5.040 - 4.660
Range group 2 - - - - - - - - - -	3.306 - 2.983	----- -----	2.086 - 1.984	4.659 - 4.279
Range group 3 - - - - - - - - - -	2.982 - 2.537	----- -----	1.983 - 1.797	4.278 - 3.395
Range group 4 - - - - - - - - - -	2.536 - 2.090	----- -----	1.796 - 1.610	3.394 - 2.510
Egg production;				
Average - number/hen housed -	219.43	251.45	174.47	198.33
Range group 1 - - - - - - - - - -	239.10 - 229.27	274.20 - 262.83	184.80 - 179.64	220.40 - 209.37
Range group 2 - - - - - - - - - -	229.26 - 219.43	262.82 - 251.45	179.63 - 174.47	209.36 - 198.33
Range group 3 - - - - - - - - - -	219.42 - 205.12	251.44 - 236.13	174.46 - 168.29	198.32 - 174.87
Range group 4 - - - - - - - - - -	205.11 - 190.80	236.12 - 220.80	168.28 - 162.10	174.86 - 151.40
Age at 50 percent production;				
Average - - - - - - - - - days -	170.0	152.3	186.5	188.1
Range group 1 - - - - - - - - - -	165.0 - 167.5	151.0 - 151.7	175.0 - 180.8	175.0 - 181.5
Range group 2 - - - - - - - - - -	167.6 - 170.0	151.8 - 152.3	180.9 - 186.5	181.6 - 188.1
Range group 3 - - - - - - - - - -	170.1 - 173.0	152.4 - 153.7	186.6 - 192.3	188.2 - 193.5
Range group 4 - - - - - - - - - -	173.1 - 176.0	153.8 - 155.0	192.4 - 198.0	193.6 - 199.0
Growing mortality;				
Average - - - - - - - - percent -	3.33	6.18	4.09	9.25
Range group 1 - - - - - - - - - -	1.00 - 2.16	3.20 - 4.69	2.20 - 3.15	2.30 - 5.78
Range group 2 - - - - - - - - - -	2.17 - 3.33	4.70 - 6.18	3.16 - 4.09	5.79 - 9.25
Range group 3 - - - - - - - - - -	3.34 - 4.46	6.19 - 11.49	4.10 - 5.25	9.26 - 20.18
Range group 4 - - - - - - - - - -	4.47 - 5.60	11.50 - 16.80	5.26 - 6.40	20.19 - 31.10
Laying mortality;				
Average - - - - - - - - percent -	12.47	13.50	11.92	21.65
Range group 1 - - - - - - - - - -	8.60 - 10.53	9.80 - 11.65	7.00 - 9.46	12.70 - 17.18
Range group 2 - - - - - - - - - -	10.54 - 12.47	11.66 - 13.50	9.47 - 11.92	17.19 - 21.65
Range group 3 - - - - - - - - - -	12.48 - 14.78	13.51 - 16.25	11.93 - 15.61	21.66 - 30.88
Range group 4 - - - - - - - - - -	14.79 - 17.10	16.26 - 19.00	15.62 - 19.30	30.89 - 40.10
Egg weight;				
Average - - - - - ounces/dozen-	25.40	24.52	25.29	25.68
Range group 1 - - - - - - - - - -	26.40 - 25.90	25.20 - 24.86	26.20 - 25.74	26.80 - 26.24
Range group 2 - - - - - - - - - -	25.89 - 25.40	24.85 - 24.52	25.73 - 25.29	26.23 - 25.68
Range group 3 - - - - - - - - - -	25.39 - 25.10	24.51 - 24.01	25.28 - 24.84	25.67 - 24.64
Range group 4 - - - - - - - - - -	25.09 - 24.80	24.00 - 23.50	24.83 - 24.40	24.63 - 23.60
Large and extra large eggs;				
Average - - - - - - - - percent -	66.81	68.36	79.71	87.91
Range group 1 - - - - - - - - - -	77.80 - 72.30	75.50 - 71.93	87.80 - 83.76	95.40 - 91.65
Range group 2 - - - - - - - - - -	72.29 - 66.81	71.92 - 68.36	83.75 - 79.71	91.64 - 87.91
Range group 3 - - - - - - - - - -	66.80 - 63.40	68.35 - 63.18	79.70 - 76.46	87.90 - 76.40
Range group 4 - - - - - - - - - -	63.39 - 60.00	63.17 - 58.00	76.45 - 73.20	76.39 - 64.90
Feed per pound of eggs;				
Average - - - - - - - - pounds -	2.590	2.691	3.164	2.684
Range group 1 - - - - - - - - - -	2.430 - 2.510	2.500 - 2.595	2.960 - 3.063	2.430 - 2.557
Range group 2 - - - - - - - - - -	2.511 - 2.590	2.596 - 2.691	3.064 - 3.164	2.558 - 2.684
Range group 3 - - - - - - - - - -	2.591 - 2.740	2.692 - 2.915	3.165 - 3.348	2.685 - 2.992
Range group 4 - - - - - - - - - -	2.741 - 2.890	2.916 - 3.140	3.349 - 3.530	2.993 - 3.300
Albumen quality;				
Average - - - - - Haugh units -	75.42	73.13	89.48	77.69
Range group 1 - - - - - - - - - -	81.20 - 78.31	80.20 - 76.67	93.50 - 91.49	84.00 - 80.85
Range group 2 - - - - - - - - - -	78.30 - 75.42	76.66 - 73.13	91.48 - 89.48	80.84 - 77.69
Range group 3 - - - - - - - - - -	75.41 - 71.36	73.12 - 69.82	89.47 - 87.44	77.68 - 74.70
Range group 4 - - - - - - - - - -	71.35 - 67.30	69.81 - 66.50	87.43 - 85.40	74.69 - 71.70
Blood spots, all sizes;				
Average - - - - - - - - percent -	2.97	3.03	5.74	5.17
Range group 1 - - - - - - - - - -	1.60 - 2.28	1.70 - 2.36	1.00 - 3.37	2.40 - 3.79
Range group 2 - - - - - - - - - -	2.29 - 2.97	2.37 - 3.03	3.38 - 5.74	3.80 - 5.17
Range group 3 - - - - - - - - - -	2.98 - 4.73	3.04 - 3.61	5.75 - 11.92	5.18 - 6.64
Range group 4 - - - - - - - - - -	4.74 - 6.50	3.62 - 4.20	11.93 - 18.10	6.65 - 8.10

Traits measured	Tests			
	Missouri Floor	New Hampshire	New Jersey	North Carolina
Income over feed and chick cost;				
Average - - - dol./hen housed -	3.739	4.989	5.165	2.110
Range group 1 - - - - - - - - - -	5.540 - 4.640	5.850 - 5.419	5.760 - 5.462	3.270 - 2.690
Range group 2 - - - - - - - - - -	4.639 - 3.739	5.418 - 4.989	5.461 - 5.165	2.689 - 2.110
Range group 3 - - - - - - - - - -	3.738 - 2.625	4.988 - 4.324	5.164 - 4.422	2.109 - 1.575
Range group 4 - - - - - - - - - -	2.624 - 1.510	4.323 - 3.660	4.421 - 3.680	1.574 - 1.040
Egg production;				
Average - number/hen housed -	169.39	205.54	240.55	204.94
Range group 1 - - - - - - - - - -	231.80 - 200.60	233.20 - 219.37	259.00 - 249.77	251.60 - 228.27
Range group 2 - - - - - - - - - -	200.59 - 169.39	219.36 - 205.54	249.76 - 240.55	228.26 - 204.94
Range group 3 - - - - - - - - - -	169.38 - 135.00	205.53 - 185.12	240.54 - 224.77	204.93 - 186.72
Range group 4 - - - - - - - - - -	134.99 - 100.60	185.11 - 164.70	224.76 - 209.00	186.71 - 168.50
Age at 50 percent production;				
Average - - - - - - - - - days -	189.8	171.3	161.8	175.0
Range group 1 - - - - - - - - - -	170.0 - 179.9	161.0 - 166.1	152.0 - 156.9	165.0 - 170.0
Range group 2 - - - - - - - - - -	180.0 - 189.8	166.2 - 171.3	157.0 - 161.8	170.1 - 175.0
Range group 3 - - - - - - - - - -	189.9 - 200.4	171.4 - 176.6	161.9 - 168.9	175.1 - 179.5
Range group 4 - - - - - - - - - -	200.5 - 211.0	176.7 - 182.0	169.0 - 176.0	179.6 - 184.0
Growing mortality;				
Average - - - - - - - -percent -	21.03	5.50	4.47	7.88
Range group 1 - - - - - - - - - -	4.20 - 12.61	1.10 - 3.30	1.80 - 3.14	1.10 - 4.49
Range group 2 - - - - - - - - - -	12.62 - 21.03	3.31 - 5.50	3.15 - 4.47	4.50 - 7.88
Range group 3 - - - - - - - - - -	21.04 - 34.46	5.51 - 8.70	4.48 - 5.89	7.89 - 13.24
Range group 4 - - - - - - - - - -	34.47 - 47.90	8.71 - 11.90	5.90 - 7.30	13.25 - 18.60
Laying mortality;				
Average - - - - - - - -percent -	30.24	15.10	10.55	18.50
Range group 1 - - - - - - - - - -	3.50 - 16.87	7.00 - 11.05	4.00 - 7.27	5.70 - 12.10
Range group 2 - - - - - - - - - -	16.88 - 30.24	11.06 - 15.10	7.28 - 10.55	12.11 - 18.50
Range group 3 - - - - - - - - - -	30.25 - 43.77	15.11 - 21.55	10.56 - 13.27	18.51 - 23.95
Range group 4 - - - - - - - - - -	43.78 - 57.30	21.56 - 28.00	13.28 - 16.00	23.96 - 29.40
Egg weight;				
Average - - - - ounces/dozen -	24.83	26.34	26.85	27.07
Range group 1 - - - - - - - - - -	26.00 - 25.42	27.60 - 26.97	27.50 - 27.17	28.60 - 27.84
Range group 2 - - - - - - - - - -	25.41 - 24.83	26.96 - 26.34	27.16 - 26.85	27.83 - 27.07
Range group 3 - - - - - - - - - -	24.82 - 24.22	26.33 - 25.72	26.84 - 26.32	27.06 - 26.34
Range group 4 - - - - - - - - - -	24.21 - 23.60	25.71 - 25.10	26.31 - 25.80	26.33 - 25.60
Large and extra large eggs;				
Average - - - - - - - -percent -	78.66	80.10	69.20	89.10
Range group 1 - - - - - - - - - -	88.90 - 83.78	91.90 - 86.00	79.70 - 74.45	95.40 - 92.23
Range group 2 - - - - - - - - - -	83.77 - 78.66	85.99 - 80.10	74.44 - 69.20	92.22 - 89.10
Range group 3 - - - - - - - - - -	78.65 - 71.53	80.09 - 71.35	69.19 - 61.00	89.09 - 81.58
Range group 4 - - - - - - - - - -	71.52 - 64.40	71.34 - 62.60	60.99 - 52.80	81.57 - 74.10
Feed per pound of eggs;				
Average - - - - - - - - pounds -	2.733	2.703	2.484	2.599
Range group 1 - - - - - - - - - -	2.420 - 2.576	2.330 - 2.516	2.340 - 2.412	2.320 - 2.459
Range group 2 - - - - - - - - - -	2.577 - 2.733	2.517 - 2.703	2.413 - 2.484	2.460 - 2.599
Range group 3 - - - - - - - - - -	2.734 - 2.936	2.704 - 2.911	2.485 - 2.717	2.600 - 2.799
Range group 4 - - - - - - - - - -	2.937 - 3.140	2.912 - 3.120	2.718 - 2.950	2.800 - 3.000
Albumen quality;				
Average - - - - - Haugh units -	77.10	73.62	83.13	76.98
Range group 1 - - - - - - - - - -	82.90 - 80.00	81.70 - 77.66	87.20 - 85.16	83.00 - 79.99
Range group 2 - - - - - - - - - -	79.99 - 77.10	77.65 - 73.62	85.15 - 83.13	79.98 - 76.98
Range group 3 - - - - - - - - - -	77.09 - 74.15	73.61 - 71.16	83.12 - 81.46	76.97 - 73.74
Range group 4 - - - - - - - - - -	74.14 - 71.20	71.15 - 68.70	81.45 - 79.80	73.73 - 70.50
Blood spots, all sizes;				
Average - - - - - - - -percent -	3.61	1.63	2.38	3.08
Range group 1 - - - - - - - - - -	1.00 - 2.31	0.00 - 0.81	1.40 - 1.89	1.60 - 2.34
Range group 2 - - - - - - - - - -	2.32 - 3.61	0.82 - 1.63	1.90 - 2.38	2.35 - 3.08
Range group 3 - - - - - - - - - -	3.62 - 5.26	1.64 - 3.06	2.39 - 5.19	3.09 - 4.04
Range group 4 - - - - - - - - - -	5.27 - 6.90	3.07 - 4.50	5.20 - 8.00	4.05 - 5.00

Traits measured	Tests		
	Pennsylvania	Tennessee	Texas
Income over feed and chick cost;			
Average - - - - dol./hen housed -	2.968	4.394	-----
Range group 1 - - - - - - - - - - -	3.640 - 3.304	5.440 - 4.917	----- -----
Range group 2 - - - - - - - - - - -	3.303 - 2.968	4.916 - 4.394	----- -----
Range group 3 - - - - - - - - - - -	2.967 - 2.364	4.393 - 3.757	----- -----
Range group 4 - - - - - - - - - - -	2.363 - 1.760	3.756 - 3.120	----- -----
Egg production;			
Average - - number/hen housed -	215.22	216.19	174.85
Range group 1 - - - - - - - - - - -	238.70 - 226.96	241.50 - 228.84	216.50 - 195.68
Range group 2 - - - - - - - - - - -	226.95 - 215.22	228.83 - 216.19	195.67 - 174.85
Range group 3 - - - - - - - - - - -	215.21 - 200.36	216.18 - 198.74	174.84 - 157.43
Range group 4 - - - - - - - - - - -	200.35 - 185.50	198.73 - 181.30	157.42 - 140.00
Age at 50 percent production;			
Average - - - - - - - - - days -	167.0	160.1	182.2
Range group 1 - - - - - - - - - - -	160.0 - 163.5	149.0 - 154.5	174.0 - 178.1
Range group 2 - - - - - - - - - - -	163.6 - 167.0	154.6 - 160.1	178.2 - 182.2
Range group 3 - - - - - - - - - - -	167.1 - 171.5	160.2 - 166.5	182.3 - 186.1
Range group 4 - - - - - - - - - - -	171.6 - 176.0	166.6 - 173.0	186.2 - 190.0
Growing mortality;			
Average - - - - - - - -percent -	1.31	2.94	13.93
Range group 1 - - - - - - - - - - -	0.00 - 0.65	0.00 - 1.47	5.80 - 9.86
Range group 2 - - - - - - - - - - -	0.66 - 1.31	1.48 - 2.94	9.87 - 13.93
Range group 3 - - - - - - - - - - -	1.32 - 2.95	2.95 - 7.77	13.94 - 18.56
Range group 4 - - - - - - - - - - -	2.96 - 4.60	7.78 - 12.60	18.57 - 23.20
Laying mortality;			
Average - - - - - - - - -percent -	18.04	14.66	25.49
Range group 1 - - - - - - - - - - -	6.70 - 12.37	6.70 - 10.68	3.70 - 14.59
Range group 2 - - - - - - - - - - -	12.38 - 18.04	10.69 - 14.66	14.60 - 25.49
Range group 3 - - - - - - - - - - -	18.05 - 28.62	14.67 - 19.83	25.50 - 33.74
Range group 4 - - - - - - - - - - -	28.63 - 39.20	19.84 - 25.00	33.75 - 42.00
Egg weight;			
Average - - - - - ounces/dozen -	25.58	25.20	24.51
Range group 1 - - - - - - - - - - -	27.20 - 26.39	26.00 - 25.60	25.50 - 25.01
Range group 2 - - - - - - - - - - -	26.38 - 25.58	25.59 - 25.20	25.00 - 24.51
Range group 3 - - - - - - - - - - -	25.57 - 25.04	25.19 - 24.60	24.50 - 23.61
Range group 4 - - - - - - - - - - -	25.03 - 24.50	24.59 - 24.00	23.60 - 22.70
Large and extra large eggs;			
Average - - - - - - - - -percent -	64.50	73.03	-----
Range group 1 - - - - - - - - - - -	82.30 - 73.40	83.40 - 78.21	----- -----
Range group 2 - - - - - - - - - - -	73.39 - 64.50	78.20 - 73.03	----- -----
Range group 3 - - - - - - - - - - -	64.49 - 55.75	73.02 - 64.81	----- -----
Range group 4 - - - - - - - - - - -	55.74 - 47.00	64.80 - 56.60	----- -----
Feed per pound of eggs;			
Average - - - - - - - - pounds -	3.171	2.826	2.796
Range group 1 - - - - - - - - - - -	2.870 - 3.020	2.600 - 2.713	2.610 - 2.703
Range group 2 - - - - - - - - - - -	3.021 - 3.171	2.714 - 2.826	2.704 - 2.796
Range group 3 - - - - - - - - - - -	3.172 - 3.415	2.827 - 3.048	2.797 - 3.073
Range group 4 - - - - - - - - - - -	3.416 - 3.660	3.049 - 3.270	3.074 - 3.350
Albumen quality;			
Average - - - - - - Haugh units -	79.50	73.89	80.34
Range group 1 - - - - - - - - - - -	85.90 - 82.70	80.40 - 77.14	84.60 - 82.47
Range group 2 - - - - - - - - - - -	82.69 - 79.50	77.13 - 73.89	82.46 - 80.34
Range group 3 - - - - - - - - - - -	79.49 - 76.15	73.88 - 72.24	80.33 - 78.67
Range group 4 - - - - - - - - - - -	76.14 - 72.80	72.23 - 70.60	78.66 - 77.00
Blood spots, all sizes;			
Average - - - - - - - - -percent -	3.48	2.66	3.14
Range group 1 - - - - - - - - - - -	0.90 - 2.19	0.30 - 1.48	0.90 - 2.02
Range group 2 - - - - - - - - - - -	2.20 - 3.48	1.49 - 2.66	2.03 - 3.14
Range group 3 - - - - - - - - - - -	3.49 - 5.64	2.67 - 4.53	3.15 - 4.07
Range group 4 - - - - - - - - - - -	5.65 - 7.80	4.54 - 6.40	4.08 - 5.00

Table 5.--Range group ranking for stock entered in 1969-70 random sample egg production tests

ENTRY IDENTIFICATION	TEST	BREEDING		STRAIN OR TRADENAME	INCOME OVER FEED AND CHICK COST ($)	EGG PRODUCTION (No.) (Hen housed)	AGE AT 50% PRODUCTION (Days)	GROWING MORTALITY (%)	LAYING MORTALITY (%)	EGG WEIGHT (oz)	LARGE AND EXTRA LARGE EGGS (%)	FEED PER POUND OF EGGS (lbs)	ALBUMEN QUALITY (H.U.)	BLOOD SPOTS (%)
Animal Research Institute, Ottawa, Ontario														
A.R.L., Ont. ----------------------	C.C.	WL	PS	Kentville R. B. C. -	4	4	4	4	4	3	4	4	3	4
Anthony, Geo. M. & Sons, Strausstown, Pennsylvania														
Anthony, Pa. ---------------------	Minn.	WL	SX	Anthony------------	3	3	3	2	2	2	2	3	2	1
Anthony, Pa. ---------------------	Mo.-C.	WL	SX	Anthony------------	2	2	3	2	3	1	1	2	1	2
Anthony, Pa. ---------------------	Mo.-F.	WL	SX	Anthony------------	2	2	3	1	2	2	2	2	2	2
Anthony, Pa. ---------------------	N.J.	WL	SX	Anthony------------	3	3	3	4	4	2	3	1	3	2
Anthony, Pa. ---------------------	N.C.	WL	SX	Anthony------------	2	2	3	1	2	2	2	2	2	2
Anthony, Pa. ---------------------	Pa.	WL	SX	Anthony------------	3	2	4	2	1	4	3	3	2	1
Anthony, Pa. ---------------------	Tenn.	WL	SX	Anthony------------	2	3	4	3	2	1	2	2	1	2
Babcock Poultry Farm, Inc., Ithaca, New York														
Babcock, N.Y. -------------------	C.C.	WL	SX	Babcock B-300 ---	1	1	1	3	2	2	2	1	3	2
Babcock, N.Y. -------------------	Fla.	WL	SX	Babcock B-300 ---	-	1	1	2	2	2	2	1	3	4
Babcock, N.Y. -------------------	Mo.-C.	WL	SX	Babcock B-300 ---	1	1	1	3	2	3	2	1	3	3
Babcock, N.Y. (Ballew, Mo.)------	Mo.-F.	WL	SX	Babcock B-300 ---	3	2	1	4	3	3	3	1	3	2
Babcock, N.Y. -------------------	N.H.	WL	SX	Babcock B-300 ---	1	1	1	4	3	3	2	1	3	3
Babcock, N.Y. (Babcock, Pa.)-----	N.J.	WL	SX	Babcock B-300 ---	1	1	1	2	1	2	2	1	4	1
Babcock, N.Y. (Beamsdale, N.C.)--	N.C.	WL	SX	Babcock B-300 ---	2	2	1	4	4	3	2	1	3	2
Babcock, N.Y. (Babcock, Pa.)-----	Pa.	WL	SX	Babcock B-300 ---	1	2	1	2	4	3	3	1	3	1
Babcock, N.Y. (Pinckard, Tenn.)--	Tenn.	WL	SX	Babcock B-300 ---	1	1	1	1	2	1	1	1	3	4
Babcock, N.Y. (Center, Texas)----	Texas	WL	SX	Babcock B-300 ---	-	2	1	4	3	2	-	1	3	4
Babcock Poultry Farm, Inc., Ithaca, New York														
Babcock, N.Y. (Gulf Coast, Hodges, Fla.)-	Fla.	WL	SX	Babcock B-305 ---	-	1	1	1	2	1	1	1	3	4
Babcock, N.Y. -------------------	Minn.	WL	SX	Babcock B-305 ---	1	1	2	3	1	1	2	1	3	1
Babcock, N.Y. -------------------	Mo.-C.	WL	SX	Babcock B-305 ---	1	1	1	2	2	2	2	1	3	2
Babcock, N.Y. -------------------	Mo.-F.	WL	SX	Babcock B-305 ---	3	2	1	3	3	2	2	1	3	2
Babcock, N.Y. (Babcock, Pa.)-----	N.J.	WL	SX	Babcock B-305 ---	2	2	2	4	3	2	3	1	4	1
Babcock, N.Y. (Hodges, Fla.)-----	N.C.	WL	SX	Babcock B-305 ---	2	2	1	3	4	2	3	1	3	2
Babcock, N.Y. (Babcock, Pa.)-----	Pa.	WL	SX	Babcock B-305 ---	1	1	1	3	3	3	2	1	4	3
Babcock, N.Y. -------------------	Tenn.	WL	SX	Babcock B-305 ---	1	1	1	2	3	2	2	1	4	2
Babcock, N.Y. -------------------	Texas	WL	SX	Babcock B-305 ---	-	3	2	4	3	2	-	1	4	1
Babcock Poultry Farm, Inc., Ithaca, New York														
Babcock, N.Y. -------------------	N.H.	RIRxBPR	BX	Babcock B-390 ---	1	1	2	1	1	2	2	2	3	3
Babcock, N.Y. (Beamsdale, N.C.) --------	Pa.	RIRxBPR	BX	Babcock B-390 ---	3	2	2	4	1	1	1	3	3	4
Burling Hatchery, Oxford, Pennsylvania														
Burling, Pa. ---------------------	Pa.	RIRxWPR	BX	Golden Tri-Cross-	4	3	2	1	1	2	2	3	2	4

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Table 5.--Range group ranking for stock entered in 1969-70 random sample egg production tests--Continued

ENTRY IDENTIFICATION	TEST	BREEDING	STRAIN OR TRADENAME	INCOME OVER FEED AND CHICK COST ($)	EGG PRODUCTION (Hen housed) (No.)	AGE AT 50% PRODUCTION (Days)	GROWING MORTALITY (%)	LAYING MORTALITY (%)	EGG WEIGHT (oz)	LARGE AND EXTRA LARGE EGGS (%)	FEED PER POUND OF EGGS (lbs)	ALBUMEN QUALITY (H.U.)	BLOOD SPOTS (%)
Carey Farms, Marion, Ohio													
Carey, Ohio ----	Mo.-F.	WL	IN	Carey's New Nick---	2	2	4	3	2	2	1	3	2	3
Carey, Ohio ----	Pa.	WL	IN	Carey's New Nick---	2	2	4	1	2	4	4	2	3	1
Carey Farms, Marion, Ohio													
Carey, Ohio ----	Tenn.	CGxWL	BX	Carey New Spots----	3	3	3	4	3	2	2	3	4	1
Cashman Leghorn Farm, Webster, Kentucky													
Cashman, Ky. ----	Mo.-C.	WL	IN	Cashman Hi-Cash---	3	3	4	3	3	2	2	3	3	4
Cashman, Ky. ----	Mo.-F.	WL	IN	Cashman Hi-Cash---	3	3	2	4	3	3	3	3	3	3
Cashman, Ky. ----	N.C.	WL	IN	Cashman Hi-Cash---	2	2	4	2	1	3	2	3	3	4
Cashman, Ky. ----	Tenn.	WL	IN	Cashman Hi-Cash---	3	3	4	1	2	3	2	4	2	3
Colonial Poultry Farms, Inc., Pleasant Hill, Missouri													
Colonial, Mo. ----	Mo.-C.	WL	IN	True-Line 142 S ----	2	2	1	2	3	2	3	2	3	3
Colonial Poultry Farms, Inc., Pleasant Hill, Missouri													
Colonial, Mo. (Colonial, Minn.)	Minn.	WL	IN	True-Line 365 B ---	1	2	1	1	3	3	3	3	4	3
Colonial, Mo. ----	Mo.-F.	WL	IN	True-Line 365 B ---	2	2	2	2	2	3	3	2	3	3
Colonial, Mo. ----	Pa.	WL	IN	True-Line 365 B ---	1	3	2	2	2	3	3	1	3	3
Davis, Joe K., Hatchery, Earl, North Carolina													
Davis, N.C. ----	Mo.-C.	RIR	SX	Davis Red --------	3	3	4	2	1	2	2	4	2	4
Davis, N.C. ----	N.H.	RIR	SX	Davis Red --------	3	3	4	2	1	3	2	3	3	1
Davis, N.C. ----	N.C.	RIR	SX	Davis Red --------	3	2	4	1	1	2	1	3	2	3
Davis, N.C. ----	Texas	RIR	SX	Davis Red --------	-	3	4	1	1	2	-	4	2	2
Erath Egg Farm, Stephenville, Texas													
Erath, Texas ----	Texas	---	INX	Erath Mestiza -----	-	4	3	3	4	4	-	4	2	3
Fisher Poultry Farm, Ltd., Ayton, Ontario													
Fisher, Ont. ----	C.C.	WL	SX	Fisher 105 --------	2	3	2	2	4	4	3	1	1	2
Fisher, Ont. ----	Minn.	WL	SX	Fisher 105 --------	3	4	4	3	2	3	3	3	1	2
Garber Poultry Breeding Farm, Modesto, California													
Garber, Calif. (Orange Blossom, Fla.) ----	Fla.	WL	SX	Garber G 200 ------	-	3	4	3	4	3	3	2	2	1
Garber, Calif. (Minnesota, Minn.)------	Minn.	WL	SX	Garber G 200 ------	3	3	3	3	2	3	2	3	1	2
Garber, Calif. ----	Mo.-F.	WL	SX	Garber G 200 ------	2	2	2	3	3	3	3	3	2	1
Garber, Calif. (Garber, N.J.) ----	N.J.	WL	SX	Garber G 200 ------	2	3	3	3	4	3	3	1	1	1
Garber, Calif. ----	Pa.	WL	SX	Garber G 200 ------	2	2	3	3	2	3	3	2	1	1
Garber, Calif. ----	Texas	WL	SX	Garber G 200 ------	-	3	3	3	2	3	-	3	1	2

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Table 5.--Range group ranking for stock entered in 1969-70 random sample egg production tests--Continued

ENTRY IDENTIFICATION	TEST	BREEDING	STRAIN OR TRADENAME	INCOME OVER FEED AND CHICK COST ($)	EGG PRODUCTION (Hen housed) (No.)	AGE AT 50% PRODUCTION (Days)	GROWING MORTALITY (%)	LAYING MORTALITY (%)	EGG WEIGHT (oz.)	LARGE AND EXTRA LARGE EGGS (%)	FEED PER POUND OF EGGS (lbs)	ALBUMEN QUALITY (H.U.)	BLOOD SPOTS (%)
Garber Poultry Breeding Farm, Modesto, California													
Garber, Calif.	Mo.-C.	CGxWL	Garber G x 291	BX	2	2	1	1	2	3	3	3	4	1
Garber, Calif.	N.C.	CGxWL	Garber G x 291	BX	2	2	1	1	1	3	3	2	3	2
Garber, Calif.	Pa.	CGxWL	Garber G x 291	BX	3	3	1	3	2	3	3	2	3	1
Garber, Calif.	Tenn.	CGxWL	Garber G x 291	BX	3	3	1	1	2	3	3	3	3	1
Garrison, Earl W., Bridgeton New Jersey													
Garrison, N.J.	N.J.	WL	Garrison 301	SX	3	3	3	2	2	2	2	3	2	2
Harco Farms, South Easton, Massachusetts													
Harco, Mass.	N.H.	RIRxBPR	Harco Sex Link	BX	1	1	2	1	2	1	1	2	2	2
Harco, Mass.	Pa.	RIRxBPR	Harco Sex Link	BX	3	3	2	1	2	1	1	3	3	3
Hardy, C. Nelson & Sons, Essex, Massachusetts													
Hardy, Mass.	N.H.	RIRxBPR	Deluxe Sex Link	BX	4	4	3	1	4	2	2	4	4	4
Hubbard Farms, Inc., Walpole, New Hampshire													
Hubbard, N.H. (Humbert, Quebec)	C.C.	Syn.xNH	Golden Comet	BX	3	3	1	2	3	1	1	4	3	4
Hubbard, N.H.	N.H.	Syn.xNH	Golden Comet	BX	3	2	1	1	2	1	1	2	2	1
Hubbard, N.H. (Hubbard, N.C.)	N.C.	Syn.xNH	Golden Comet	BX	3	3	2	1	3	1	1	3	2	3
Hubbard, N.H. (Hubbard, Pa.)	Pa.	Syn.xNH	Golden Comet	BX	3	3	1	1	2	1	1	2	3	4
Hy-Line Poultry Farms, Des Moines, Iowa													
Hy-Line, Iowa	Minn.	--	Hy-Line 934	INX	1	1	3	1	1	1	2	1	4	2
Hy-Line, Iowa (Hy-Line, Iowa)	Mo.-C.	--	Hy-Line 934	INX	1	1	3	2	1	1	1	1	4	2
Hy-Line, Iowa (Hy-Line, Iowa)	Mo.-F.	--	Hy-Line 934	INX	1	1	1	1	1	2	2	1	4	1
Hy-Line, Iowa (Wallace, Fla.)	N.C.	--	Hy-Line 934	INX	3	4	4	3	2	1	1	2	4	2
Hy-Line, Iowa (Smith, Tenn.)	Tenn.	--	Hy-Line 934	INX	2	3	4	1	1	1	1	1	4	4
Hy-Line, Iowa	Texas	--	Hy-Line 934	INX	-	2	4	1	2	1	-	1	4	2
Hy-Line Poultry Farms, Des Moines, Iowa													
Hy-Line, Iowa (Hy-Line, Ont.)	C.C.	--	Hy-Line 934 E	INX	2	2	3	3	1	2	1	1	4	1
Hy-Line, Iowa (Wallace, Fla.)	Fla.	--	Hy-Line 934 E	INX	-	2	3	1	2	1	1	2	4	1
Hy-Line, Iowa (Hy-Line, Iowa)	Mo.-C.	--	Hy-Line 934 E	INX	1	1	2	1	1	2	2	1	4	1
Kazmeier, Texas	Texas	--	Hy-Line 934 E	INX	-	3	4	2	3	2	-	1	4	1
Hy-Line Poultry Farms, Des Moines, Iowa													
Hy-Line, Iowa (Hy-Line, Iowa)	Mo.-F.	--	Hy-Line 934 L	INX	2	2	3	2	2	1	1	2	4	1
Hy-Line, Iowa	Texas	--	Hy-Line 934 L	INX	-	3	3	1	3	2	-	1	3	3

Table 5.--Range group ranking for stock entered in 1969-70 random sample egg production tests--Continued

ENTRY IDENTIFICATION	TEST	BREEDING	STRAIN OR TRADENAME	INCOME OVER FEED AND CHICK COST ($)	EGG PRODUCTION (Hen housed) (No.)	AGE AT 50% PRODUCTION (Days)	GROWING MORTALITY (%)	LAYING MORTALITY (%)	EGG WEIGHT (oz)	LARGE AND EXTRA LARGE EGGS (%)	FEED PER POUND OF EGGS (lbs)	ALBUMEN QUALITY (H.U.)	BLOOD SPOTS (%)
Ideal Poultry Breeding Farm, Inc., Cameron, Texas													
Ideal, Texas	Fla.	Syn.xWL BX	Ideal 236	-	3	2	3	3	1	1	1	3	2
Ideal, Texas	Minn.	Syn.xWL BX	Ideal 236	2	2	2	1	4	3	3	3	3	1
Ideal, Texas	Mo.-C.	Syn.xWL BX	Ideal 236	2	2	3	1	2	1	1	2	3	3
Ideal, Texas	Mo.-F.	Syn.xWL BX	Ideal 236	2	2	1	1	2	2	2	2	3	2
Ideal, Texas	N.C.	Syn.xWL BX	Ideal 236	2	2	3	2	2	2	2	2	3	2
Ideal, Texas	Tenn.	Syn.xWL BX	Ideal 236	3	3	3	3	4	1	1	2	3	2
Ideal, Texas	Texas	Syn.xWL BX	Ideal 236	-	2	2	1	2	2	-	2	3	4
Ideal Poultry Breeding Farm, Inc., Cameron, Texas													
Ideal, Texas	Mo.-F.	Syn.xWL SX	Ideal 345	2	2	2	2	2	2	1	1	3	3
Ideal, Texas	Pa.	Syn.xWL SX	Ideal 345	2	3	3	4	2	3	3	2	2	2
Ideal, Texas	Texas	Syn.xWL SX	Ideal 345	-	3	2	4	3	2	-	3	2	4
Indiana Farm Bureau Coop, Indianapolis, Indiana													
Ind. Farm Bur., Ind.	Mo.-C.	WL	Princess 55	2	2	4	2	1	2	1	2	1	1
Ind. Farm Bur., Ind.	Mo.-F.	WL	Princess 55	2	3	3	2	2	2	1	2	1	2
Ind. Farm Bur., Ind. (Coop., Ind.)	N.C.	WL	Princess 55	2	3	4	3	2	2	2	2	1	3
Ind. Farm Bur., Ind. (Res. Farm, Ind.)	Pa.	WL	Princess 55	3	4	4	3	3	3	2	3	1	1
Indiana Farm Bureau Coop., Indianapolis, Indiana													
Ind. Farm Bur., Ind.	Mo.-C.	WL	Duchess 60	3	4	3	2	4	2	2	2	1	1
Ind. Farm Bur., Ind.	Mo.-F.	WL	Duchess 60	2	2	3	1	2	2	2	3	1	3
Ind. Farm Bur., Ind.	Pa.	WL	Duchess 60	3	3	4	2	3	2	2	3	1	2
Jacobson Hatchery, Hartley, Iowa													
Jacobson, Iowa	Minn.	WL	Basketfillers	4	4	4	3	3	2	2	3	3	2
Kimber Farms, Inc., Fremont, California													
Kimber, Calif. (Scott, Ont.)	C.C.	WL	Kimber K 137	2	3	2	2	3	2	4	2	1	2
Kimber, Calif. (Fla.State & Miami Int.,Fla.)	Fla.	WL	Kimber K 137	-	2	2	2	2	4	4	1	1	3
Kimber, Calif.	Mo.-F.	WL	Kimber K 137	3	3	2	3	3	4	3	2	1	2
Kimber, Calif.	N.H.	WL	Kimber K 137	2	1	2	2	3	4	4	1	1	2
Kimber, Calif.(Larry's Kimberchik, N.Y.)	N.J.	WL	Kimber K 137	1	1	2	3	3	3	3	1	1	1
Kimber, Calif. (Nichols, Tenn,)	N.C.	WL	Kimber K 137	2	3	2	2	3	3	3	2	1	2
Kimber, Calif. (Moyer's, Pa.)	Pa.	WL	Kimber K 137	2	3	3	2	3	4	4	2	1	1

Table 5. -- Range group ranking for stock entered in 1969-70 random sample egg production tests -- Continued

ENTRY IDENTIFICATION	TEST	BREEDING	STRAIN OR TRADENAME	INCOME OVER FEED AND CHICK COST ($)	EGG PRODUCTION (Hen housed) (No.)	AGE AT 50% PRODUCTION (Days)	GROWING MORTALITY (%)	LAYING MORTALITY (%)	EGG WEIGHT (oz)	LARGE AND EXTRA LARGE EGGS (%)	FEED PER POUND OF EGGS (lbs)	ALBUMEN QUALITY (H.U.)	BLOOD SPOTS (%)
Kimber Farms, Inc., Fremont, California													
Kimber, Calif. (Mettlings, Minn.)------	Minn.	WL SX	Kimber K-141 -----	4	4	4	4	3	4	3	4	2	4
Kimber, Calif. (Mo. Valley, Mo.)------	Mo.-C.	WL SX	Kimber K-141 -----	1	1	1	1	1	3	3	2	3	4
Kimber, Calif. (Mo. Valley, Mo.)------	Mo.-F.	WL SX	Kimber K-141 -----	4	4	4	4	4	4	3	4	2	4
Kimber, Calif.------	Texas	WL SX	Kimber K-141 -----	-	3	3	2	3	3	-	3	4	2
Kimber Farms, Inc., Fremont, California													
Kimber, Calif. (Fla. State & Miami Int., Fla.)	Fla.	WL SX	Kimber K-155 -----	-	4	4	2	4	3	3	3	1	3
Kimber, Calif. (Manwaring, Ind.)---	N.J.	WL SX	Kimber K-155 -----	3	3	3	1	4	2	2	3	1	3
Kimber, Calif. (Nichols, Tenn.)---	N.C.	WL SX	Kimber K-155 -----	2	3	1	3	4	4	3	3	1	1
Kimber, Calif.---	Pa.	WL SX	Kimber K-155 -----	2	2	3	3	4	4	4	2	2	1
Kimber, Calif. (Nichols, Tenn.)---	Tenn.	WL SX	Kimber K-155 -----	2	2	2	3	2	3	3	3	1	3
Lawton, A. C. & Sons, Foxboro, Massachusetts													
Lawton, Mass.---	N.H.	RIRxWPR BX	Buff Sex Link -----	3	3	2	2	1	2	2	4	4	3
Lawton, Mass.---	N.C.	RIRxWPR BX	Buff Sex Link -----	4	3	4	2	2	1	1	4	2	4
Moyer's Chicks, Inc., Quakertown, Pennsylvania													
Moyer's, Pa.---	Pa.	CGxWL SX	Moyer MX 100 ----	3	3	1	3	3	4	4	2	4	2
North Central Regional Poultry Breeding Lab., Lafayette, Indiana													
N.C. Reg. Plty., Ind.---	Mo.-C.	WL PS	Reg. Cornell Contr.	4	4	4	4	4	4	4	4	3	2
N.C. Reg. Plty., Ind.---	Mo.-F.	WL PS	Reg. Cornell Contr.	4	4	4	3	4	4	4	4	2	3
N.C. Reg. Plty., Ind.---	N.C.	WL PS	Reg. Cornell Contr.	4	4	4	4	4	4	4	4	2	4
North Central Regional Poultry Breeding Lab., Lafayette, Indiana													
N.C. Reg. Plty., Ind.---	Fla.	WL SX	Kentville-Cornell--	-	4	4	4	4	4	4	4	3	4
N.C. Reg. Plty., Ind.---	Mo.-F.	WL SX	Kentville-Cornell--	3	3	4	3	3	4	4	4	2	3
N.C. Reg. Plty., Ind.---	N.C.	WL SX	Kentville-Cornell--	4	4	4	3	3	3	3	4	3	3
N.C. Reg. Plty., Ind.---	Tenn.	WL SX	Kentville-Cornell--	4	4	4	3	3	3	4	4	2	3
Parks Poultry Farm, Altoona, Pennsylvania													
Parks, Pa. ------	Minn.	WL SX	Keystone B-1------	1	2	2	4	3	1	1	2	3	3
Parks, Pa.------	Mo.-F.	WL SX	Keystone B-1------	3	3	3	3	3	2	1	2	3	2
Parks, Pa.------	N.H.	WL SX	Keystone B-1------	2	2	2	4	3	3	2	1	2	2
Parks, Pa.------	N.J.	WL SX	Keystone B-1------	1	2	2	3	2	2	2	2	2	2
Parks, Pa.------	N.C.	WL SX	Keystone B-1------	1	1	2	2	1	2	1	1	3	2
Parks, Pa.------	Pa.	WL SX	Keystone B-1------	1	1	2	1	3	2	2	2	3	1
Parks, Pa.------	Tenn.	WL SX	Keystone B-1------	2	2	3	2	3	1	1	2	3	3
Parks Poultry Farm, Altoona, Pennsylvania													
Parks, Pa.------	Pa.	RIRxWPR BX	Sil-Go-Links ------	4	4	2	1	2	1	1	4	3	4

Table 5.--Range group ranking for stock entered in 1969-70 random sample egg production tests--Continued

ENTRY IDENTIFICATION	TEST	BREEDING	STRAIN OR TRADENAME	INCOME OVER FEED AND CHICK COST ($)	EGG PRODUCTION (Hen housed) (No.)	AGE AT 50% PRODUCTION (Days)	GROWING MORTALITY (%)	LAYING MORTALITY (%)	EGG WEIGHT (oz)	LARGE AND EXTRA LARGE EGGS (%)	FEED PER POUND OF EGGS (lb)	ALBUMEN QUALITY (H.U.)	BLOOD SPOTS (%)
St. Augustin Coop. Hatchery, St. Augustin, Quebec													
St. Augustin, Quebec	C. C.	WL	Corvette A-1	2	2	3	2	1	2	2	2	2	1
Shaver Poultry Breeding Farm, Galt, Ontario													
Shaver, Ont.	C. C.	WL	Starcross 288	1	1	4	1	1	1	1	1	2	2
Shaver, Ont. (Delta, Fla.)	Fla.	WL	Starcross 288	-	1	1	3	1	1	1	1	3	2
Shaver, Ont.	Minn.	WL	Starcross 288	1	2	3	2	1	1	1	1	1	3
Shaver, Ont. (Blue Ribbon, Ark.)	Mo.-C.	WL	Starcross 288	3	4	2	4	4	2	2	2	3	2
Shaver, Ont. (Lux Leghornland, Iowa)	Mo.-F.	WL	Starcross 288	1	1	2	1	1	1	1	3	2	3
Shaver, Ont.	N. J.	WL	Starcross 288	2	2	3	1	2	1	1	3	2	1
Shaver, Ont.	N. C.	WL	Starcross 288	1	1	2	1	1	2	1	1	3	3
Shaver, Ont.	Pa.	WL	Starcross 288	1	1	3	2	1	2	2	2	2	1
Shaver, Ont.	Texas	WL	Starcross 288	-	1	2	2	1	1	-	1	1	1
Starline Breeders Hatchery, Saskatoon, Saskatchewan													
Starline, Sask.	C. C.	CGxWL	Pearlette	4	3	2	1	2	2	3	4	4	1
Stone's Poultry Breeding Farm, Dinuba, California													
Stone, Calif. (Hoover, Iowa)	Minn.	WL	Stone H-56 E	3	3	3	3	2	3	3	2	3	1
Stone, Calif.	N. C.	WL	Stone H-56 E	3	3	2	3	3	2	2	3	2	1
Sturtevant Farms, Inc., Halifax, Massachusetts													
Sturtevant, Mass.	N. H.	RIRxBPR	Black Sex Link	4	4	4	2	3	2	2	4	3	2
Tatum Farms, Dawsonville, Georgia													
Tatum, Ga.	Fla.	WL	Tatum T-100	-	2	2	1	1	2	2	2	3	3
Tatum, Ga.	Mo.-C.	WL	Tatum T-100	2	2	2	2	2	3	3	2	3	4
Tatum, Ga.	Mo.-F.	WL	Tatum T-100	2	2	2	3	3	2	1	2	3	2
Tatum, Ga.	N. J.	WL	Tatum T-100	1	1	1	1	1	3	2	1	3	2
Tatum, Ga.	N. C.	WL	Tatum T-100	2	3	1	4	4	3	3	1	4	3
Tatum, Ga.	Tenn.	WL	Tatum T-100	1	1	1	1	2	3	2	1	3	2
Tatum, Ga.	Texas	WL	Tatum T-100	-	2	1	3	3	3	-	1	2	4
Thornber's Plty. Br. Res. Dept., Retford, Nottinghamshire, England													
Thornber, Eng.	Minn.	WL	Thornber 808	1	1	1	3	2	4	4	1	3	1
Tokai Poultry Farm, Ltd., Retreat, Cape Province, South Africa													
Tokai, Cape Province	Fla.	BAxWL	Tokai 65	-	3	1	1	1	2	2	4	3	1

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Table 5.--Range group ranking for stock entered in 1969-70 random sample egg production tests--Continued

ENTRY IDENTIFICATION	TEST	BREEDING	STRAIN OR TRADENAME	INCOME OVER FEED AND CHICK COST ($)	EGG PRODUCTION (Hen housed) (No.)	AGE AT 50% PRODUCTION (Days)	GROWING MORTALITY (%)	LAYING MORTALITY (%)	EGG WEIGHT (oz)	LARGE AND EXTRA LARGE EGGS (%)	FEED PER POUND OF EGGS (lbs)	ALBUMEN QUALITY (H.U.)	BLOOD SPOTS (%)
Tokai Poultry Farm, Ltd., Retreat, Cape Province, South Africa													
Tokai, Cape Province -----------	Tenn.	WLxBA	BX	Tokai 102 --------	3	2	1	1	1	4	4	3	2	3
Warren, J. J., Inc., North Brookfield, Massachusetts													
Warren, Mass. ------------------	N.H.	RIRxRIW	BX	Sex-Sal-Link-F----	2	2	4	4	2	1	1	2	1	2
Warren, Mass. ------------------	Pa.	RIRxRIW	BX	Sex-Sal-Link-F----	3	3	3	3	1	2	1	3	2	4
Welp's Breeding Farm, Bancroft, Iowa													
Welp, Iowa (Tampa, Fla.) -------	Fla.	WL	SX	Welp Line 937-----	-	2	1	3	1	4	4	2	3	2
Welp, Iowa---------------------	Minn.	WL	SX	Welp Line 937-----	3	2	1	1	3	4	4	3	2	2
Welp, Iowa---------------------	Mo.-F.	WL	SX	Welp Line 937-----	3	3	1	3	4	4	4	2	3	2
Welp, Iowa---------------------	N.H.	WL	SX	Welp Line 937-----	3	3	1	3	4	4	4	2	3	2
Welp, Iowa---------------------	N.C.	WL	SX	Welp Line 937-----	2	2	1	2	2	4	4	3	3	3
Welp, Iowa---------------------	Tenn.	WL	SX	Welp Line 937-----	3	3	1	3	2	3	4	2	3	2
Welp, Iowa---------------------	Texas	WL	SX	Welp Line 937-----	-	3	1	3	3	4	-	2	2	2

RANDOM SAMPLE EGG PRODUCTION TEST ENTRIES AND CONDITIONS, 1969-70

Table 6.--Stock entered in 1969-70 tests

Breeder	Stock Code	Stock Strain or trade name	Number of entries	Tests entered C.C.	Fla.	Minn.	Mo.C.	Mo.F.	N.H.	N.J.	N.C.	Pa.	Tenn.	Texas
Animal Res. Inst.	570	Kentville R. B. C.	1	X										
Anthony	10	Anthony Leghorn	7		X	X	X	X		X	X	X	X	
Babcock	307	Babcock B-300	10	X	X	X	X	X		X	X	X	X	X
Babcock	405	Babcock B-305	9		X	X	X	X		X	X	X	X	X
Babcock	377	Babcock B-390	2						X			X		
Burling	361	Golden Tri-Cross	1									X		
Carey	372	Carey's New Nick	2					X				X		
Carey	397	Carey New Spots	1										X	
Cashman	31	Cashman Hi-Cash	4				X	X			X			
Colonial	414	True-Line 142 S	1				X						X	
Colonial	289	True-Line 365 B	3			X	X	X			X	X		
Davis	399	Davis Red	4				X	X	X		X			X
Erath	350	Erath Mestiza	1											
Fisher	604	Fisher 105	2	X		X								
Garber	66	Garber G 200	6	X	X	X	X	X		X		X		X
Garber	65	Garber G x 291	4				X				X	X	X	
Garrison	413	Garrison 301	1							X				
Harco	225	Harco Sex Link	2						X			X		
Hardy	86	Deluxe Sex Link	1						X					
Hubbard	378	Golden Comet	4	X					X		X	X		
Hy-Line	96	Hy-Line 934	6			X	X	X			X	X	X	X
Hy-Line	385	Hy-Line 934 E	4	X	X		X							X
Hy-Line	411	Hy-Line 934 L	2					X						X
Ideal	356	Ideal 236	7		X	X	X	X			X		X	X
Ideal	412	Ideal 345	3					X				X		X

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Table 6.--Stock entered in 1969-70 tests--Continued

Breeder	Code	Strain or trade name	Number of entries	Tests entered										
				C. C.	Fla.	Minn.	Mo. C	Mo. F.	N. H.	N. J.	N. C.	Pa.	Tenn.	Texas
Ind. Farm Bur.	152	Princess 55	4				X	X			X	X		
Ind. Farm Bur.	234	Duchess 60	3				X	X				X		
Jacobson	404	Baskettfillers	1		X	X		X	X	X		X		X
Kimber	110	Kimber K-137	7	X							X	X		
Kimber	111	Kimber K-141	4			X	X	X					X	
Kimber	112	Kimber K-155	5		X					X	X		X	
Lawton	117	Buff Sex Link	2						X			X		
Moyer's	415	Moyer MX 100	1				X	X			X		X	
No. Cent. Reg. Lab.	37	Reg. Cornell Control	3					X			X			
No. Cent. Reg. Lab.	409	Kentville-Cornell	4		X								X	
Parks	352	Keystone B-1	7			X	X	X	X	X	X	X		
Parks	382	Sil-Go-Links	1	X								X		
St. Augustin	566	Corvette A-1	9	X	X	X	X	X	X	X	X	X		
Shaver	181	Starcross 288	1	X										
Starline	533	Pearlette	1	X		X								
Stone	416	Stone's H-56 E	2			X			X		X			
Sturtevant	336	Black Sex Link	1				X	X	X	X	X		X	X
Tatum	401	Tatum T-100	7		X									
Thornber's	407	Thornber 808	1		X	X								
Tokai	417	Tokai 65	1		X								X	
Tokai	410	Tokai 102	1									X		
Warren	305	Sex-Sal-Link-F	2			X		X	X					
Welp	290	Welp Line 937	7		X	X	X	X	X		X	X	X	X

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Table 7. -- Management, rations, laying house environment, and vaccination provided by tests, 1969-70

Test	Hatched	Age at housing (days)	Length of test (days)	Ent- ries (num- ber)	Replications		Housing management			Sq. feet per bird
					Num- ber	Birds per rep.	Brooding	Rearing	Laying 1/	
Cent. Canada-----	4/1/69	147	497	12	4	65	Litter	Litter	Cage-2	0.45
					4	65	Litter	Litter	Cage-2	.45
Florida----------	12/4/68	150	550	12	4	50	Litter	Litter	Litter	2.9
					4	50	Litter	Litter	Cage-2	.6
Minnesota Cage---	4/24/69	160	497	14	3	70	Litter	Litter	Cage-3	.33
Minnesota Floor --	4/21/69	157	500	14	1	100	Litter	Range	Litter	1.5
Missouri Cage----	9/14/68	150	500	16	2	40	Litter	Litter	Cage-2	.56
					2	42	Litter	Litter	Cage-7	.67
					2	40	Litter	Litter	Cage-8	.58
Missouri Floor ---	3/1/69	150	500	25	1	40	Litter	Litter	Litter	2.3
					1	50	Litter	Litter	Litter	1.9
					1	60	Litter	Litter	Litter	1.6
					1	70	Litter	Litter	Litter	1.3
New Hampshire---	4/24/69	160	500	14	1	70	Litter	Litter	Litter	2.0
					3	24	Litter	Litter	Cage-3	.7
New Jersey-------	3/26/69	150	500	11	1	25	Litter	Litter	Litter	4.0
					1	25	Litter	Litter	Cage-25	1.0
North Carolina----	3/28/69	150	500	20	2	50	Slats	Slats	Slats	1.0
					2	50	Litter-slat	Litter-slat	Litter-slat	1.5
					4	26	Litter&slat	Litter&slat	Cage-2	.6
Pennsylvania -----	4/26/69	150	500	24	2	40	Litter	Litter	Cage-3	.5
					2	50	Litter	Litter	Litter	1.7
Tennessee--------	3/25/69	141	500	14	4	15	Litter	Litter	Cage-1	.9
					4	30	Litter	Litter	Cage-2	.45
Texas -----------	3/25/69	150	500	14	36 2/	6	Litter	Litter	Cage-2	.6

1/ The numerals after the word "cage" refer to the number of birds per cage.
2/ 6 replicates of 6 birds each for each of 3 rations in each of 2 houses.

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Test	Entries brooded inter-mingled	Min. oz./doz. for large eggs	Protein (percent)			Metab. energy 3/ (calories/pound)			MC/Cr. Prot. 4/		
			Start	Grow	Lay	Start	Grow	Lay	Start	Grow	Lay
Cent. Canada - Test--- No		24	15.7	10.4	17.0	1270	1290	1300	80.9	124.0	76.5
Control Ration -----			21.9	16.3	16.9	1270	1290	1300	58.0	79.1	76.9
Florida -------------- Yes		23	22.0	17.4	16.9	1340	1371	1313	60.9	78.8	77.7
Minnesota Cage------- Yes		23	20.2	15.2	16.95	1268	1215	1234	63.0	80.0	73.0
Minnesota Floor ------ Yes		23	20.2	15.2	16.95	1268	1215	1234	63.0	80.0	73.0
Missouri Cage-------- No		23	20.7	16.2	17.1	1318	1261	1261	63.7	78.0	73.9
Missouri Floor ------- No		23	20.7	16.2	17.1	1318	1261	1281	63.7	78.0	75.3
New Hampshire------- Yes		23.5	20.9	16.0	18.5 to 15.5	1340	1319	1255 to 1337	64.0	82.0	72.0 to 81.0
New Jersey ---------- Yes		24	21.2	----	18.8	1227	----	1144	57.9	----	60.9
North Carolina ------- No		23	20.0	16.0	18.3 to 16.5	1249	1238	1303 to 1335	62.4	77.4	71.2 to 80.9
Pennsylvania --------- Yes		24	21.0	17.0	18.0	1300 5/	1357 5/	1354 5/	61.9	79.8	75.2
Tennessee ----------- Yes		23	21.9	17.7	17.2	1346	1356	1280	61.1	76.7	74.5
	Yes	23	21.9	17.7	13.4	1346	1356	1315	61.1	76.7	98.2
Texas -------------- Yes		24	21.5	17.5	17.5	1264 5/	1324 5/	1354 5/	61.9	79.8	75.2

3/ Metabolizable energy is the maximum quantity of feed energy that possibly may be used by the chicken.

4/ Metabolizable calories divided by percent crude protein.

5/ Approximate metaloizable energy computed from productive energy, using 70 percent as the conversion factor.

Table 7. -- Management, rations, laying house environment, and vaccination provided by tests, 1969-70 --
Continued

Test	Lighting		Artificial heat used	R Value of insulation material 6/		Ventilation
	Rearing (hours)	Laying (hours)				
Cent. Canada ------ (7/)		(8/)	Yes	Ceiling Walls	27.9 15.1	Exhaust fans and in east wall
Florida ----------- Step down		15	No	Floor House Cage Summer House Winter	None 13.0 8.0	Natural via windows
Minnesota Cage ---- 12		12 to 16	No	Ceiling Walls	15.8 12.1	Positive pressure
Minnesota Floor---- Natural		12 to 16	No	Ceiling Walls	15.0 13.0	Exhaust fans
Missouri Cage ----- 10		14	No	Ceiling Walls	5.8 None	Ridge vents
Missouri Floor ---- Natural		14	No	Ceiling Walls	15.0 15.0	Exhaust fans in ceiling
New Hampshire ---- 14		14	No	Ceiling Walls	15.0 15.0	Exhaust fans
New Jersey-------- Natural		14	Yes	Ceiling Walls	1.9 2.4	Exhaust fans
North Carolina----- Step down.		Step up to 17	No	Ceiling Walls	7.3 1.5	Natural via windows
Pennsylvania ------ Natural		14	Yes	Ceiling Walls	15.5 15.5	Positive pressure
Tennessee -------- Natural		14	No	Half of house at and half at	4.0 13.0	Winter, positive pressure; summer, exhaust fans.
Texas ------------- Natural		15	No	None	----	Natural via windows

6/ Due to variations in type of construction, R Values will be approximate for some tests

7/ At day old -- 18-1/2 hr.; light decreased 15 minutes per wk. to meet at 15-1/2 hr. at longest day, then natural decrease until 13-1/2 hr.

8/ 13-1/2 hr. until natural increase takes light hours to 15-1/2 hr. in mid-June, then light held at 15-1/2 hr. until end of test.

Table 7. -- Management, rations, laying house environment, and vaccination provided by tests, 1969-70 -- Continued

Test	New Castle		Infectious bronchitis		Fowl Pox		Laryngo-trachitis		Encephalo-myelitis		Coccidiosis control	
	Type	Age (wk.)	Type	Age (wk.)	Type	Age (wk.)	Type	Age (wk.)	Type	Age (wk.)	Type	Age (wk.)
Cent. Canada	Spray Spray	1. 5 19	Spray Spray	1. 5 12	Wing web.	8	Vent	8	Water Water	15 21	Amprol	0-8
Florida	Water Water Water	1,3,10 16, 32 48, 64	Water Water	1, 3 10, 16	Wing web.	8	None	--	None	--	Poly-stat	0-8
Minnesota Cage	Water Water	5 14	Water Water	5 14	Wing web.	9	None	--	None	--	Amprol +	0-20
Minnesota Floor	Water Water	5 14	Water Water	5 14	Wing web.	9	None	--	None	--	Amprol +	0-20
Missouri Cage	Water Water Water	1 6 13	Water Water Water	1 6 13	Wing web.	8	Occular	8	None	--	Cocci-Vac	1
Missouri Floor	Water Water Water	1 7 16	Water Water Water	1 7 16	Wing web.	12	Occular	12	None	--	Cocci-Vac	1
New Hampshire	Dust Dust	2 20	Dust Dust	2 20	None	--	None	--	None	--	Cocci-Vac	1
New Jersey	Water Water	4 16	Water	14	Feather follicle	14	Occular	14	None	--	Amprol	8
North Carolina	Water Water Water	1 4 16	Water Water Water	1 4 16	Wing web.	12	None	--	Water	14	None (slats) Cocci-Vac Trithiodol	-- 1 1-9
Pennsylvania	Water Water Water	4 8 16	Water Water Water	4 8 16	None	--	None	--	None	--	None	--
Tennessee	Occular Occular Occular	1 day 10 20	Occular Occular Occular	1 day 10 20	Wing web.	10	None	--	None	--	Amprol	0-20
Texas	Mod. live Mod. live Mod. live	. 5 4 21	Mod. live Mod. live	. 5 4	Wing web.	8	None	--	None	--	Sulfa-quinoxaline	0-10

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